

A Naval Safety Center Publication

approach

NOVEMBER 1972 THE NAVAL AVIATION SAFETY REVIEW



THE UNIVERSITY
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Inadvertent IFR

A Pair of Close Ones

"We're going IFR! Bend it left — let's get out of here!"

Was the flight briefed for just such a possibility? Did each pilot have a personal contingency plan? More important — did each pilot know the first rule of self-survival when inadvertent IFR was encountered? Leader — *go on the gages!* Wingmen — tuck it in or break away, *then* go on the gages!

A Panic Pullout

Three *Skyhawks* took off on a VFR bombing hop. The flight rendezvoused at 1000 feet in a balanced, free-cruise formation with the designated flight leader flying right wing.

The flight climbed to 5000 feet, under GCI control, and headed for the target, which was located on an island. Weather enroute began to deteriorate. The aircraft were soon flying between cloud layers estimated at 2500 and 5000 feet. Visibility was poor and decreasing due to numerous rainshowers.

To bypass a rainshower, the formation leader started a right turn and entered a line of clouds. Light turbulence was encountered. The flight was now in close parade, IFR. The formation leader reversed left, descending, to regain VFR.

The flight leader (on the right wing) initially concentrated on keeping visual contact with the lead aircraft. After stabilizing his position, he looked into the cockpit and noticed that the flight was passing 2000 feet MSL in a 40 to 50-degree left bank, 10 degrees nose-down, with a rate of descent of 3-4000 fpm and an airspeed in excess of 350 knots. He broadcast a warning at approximately 1000 feet, and the formation leader began to roll out and level off.

The pilot flying left wing could feel the airspeed increasing and knew the flight was turning and descending. While in the clouds, he checked his





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instruments twice and saw the VSI needle pegged at 6000 fpm and the altimeter passing 2000 feet. He heard the flight leader's warning at 1000 feet. As the flight broke out of the clouds at approximately 800 feet MSL, about five degrees nose-down and in a slight left bank, he loosened his position in the flight. Quickly glancing to his left, he thought the flight was about to impact the water. He broke away and pulled up, registering 7.5 on the G-meter. The formation leader reported seeing something separate from the departing aircraft.

The left wingman reentered the clouds on the pullup, transitioned to instruments, and climbed to VFR on top (at 10,000 feet). After leveling off, he noticed that the inboard halves of his slats had ripped off. He climbed to 14,000 feet, slow-flighted the aircraft, and found control satisfactory at 140 knots. Meanwhile, the other two aircraft had leveled off at 400 feet MSL, after pulling 3.5 to 4G.

GCI vectored the aircraft to a rendezvous. They returned to base without further incident. The damaged aircraft was successfully landed using the M-21 midfield arresting gear.

A "Small Buffet"

The flight involved two A-7E *Corsair IIs*. The plan was to launch from the carrier, go feet-dry, and navigate to a preassigned target.

2 Briefing was thorough, and the takeoff was without incident. One and one-half hours later, the flight passed a checkpoint and descended to 800-1000 feet for the low-level portion of the exercise. The wingman flew lead, and the designated flight leader flew 3000 feet aft at 5 o'clock, slightly stepped up.

The next checkpoint was reached 1 minute ahead of schedule. The flight turned on the final leg to the target. Power was reduced, and airspeed slowed to about 300 knots. The flight, at this point, was tracking 1 to 2 miles south of the target, but the lead failed to notice. The flight leader advised that the target was at 3 o'clock and to come right. The lead rolled into a 10-degree right bank, and as the flight leader attempted to close the gap, the flight entered a bank of fog/low clouds. The flight leader immediately broadcast that he was pulling hard right and climbing. He climbed to VFR on top at 4000 feet.

Shortly after the wingman entered the clouds, he felt a small buffet of the aircraft, which he mistakenly attributed to low airspeed and angle-of-bank. He then commenced a full-power climb to VFR on top at 10,000 feet and proceeded toward a rendezvous with the leader.

During the rendezvous, the flight leader noted damage to the wingman's aircraft. In reality, the "small buffet" the wingman felt, had resulted from a collision with one or more pine trees. (This collision caused major

damage to the airframe [see photos] and fadded the engine to the point that it had to be changed.)

Enroute back to the ship, air-to-air refueling was accomplished, and the damaged aircraft was successfully slow-flighted. Both aircraft were recovered aboard without further incident.

Discussion

The individual pilots involved and both flight leaders must share responsibility for these two accidents. In the case of the A-7s, the wingman was briefed that a 1500-foot ceiling and 5 miles visibility would be required for the mission. He was briefed to maintain 800 feet AGL. His lead of the section, up to a time just short of the accident, seems to have been acceptable.

After his descent to low level, he questioned the flight leader about weather in the local area. He felt that it might possibly be below the prescribed minimums. The flight leader answered that the weather looked good in the direction they were to proceed, thereby encouraging the wingman to continue toward the target.

The wingman maintained 1000 feet AGL for the majority of the low-level route, which is 200 feet above the minimum authorized altitude. However, on the final leg to the target, he experienced lowering ceilings and visibility and attempted to press on into weather he felt to be below minimums. His last known altitude prior to impact was 600 feet. It appears that in trying to correct his navigation and locate the target, he allowed himself to gradually descend below minimums in order to remain clear of clouds.

He entered a cloud or fog bank at a very low level and did not initiate a climb for 10 to 15 seconds. To continue for any period of time without climbing, while in fog or clouds at low altitude is, of course, poor headwork. During this 10 to 15 second period, one of two things must have occurred: Either the terrain beneath the aircraft rose abruptly, or the pilot, utilizing poor instrument scan, allowed the aircraft to descend nearly 600 feet.

In the case of the A-4s, the pilot flying left wing directly caused damage to the aircraft by overstress during a panic pullup. Still, it's hard to be critical here when you realize he thought he was about to impact the water. The real origin of this accident began earlier when the flight leader allowed the formation leader to lead the flight into deteriorating weather. Then, once into the weather, the formation leader obviously used poor headwork in leading the flight in a turning, high-speed, high-rate descent at low altitude.

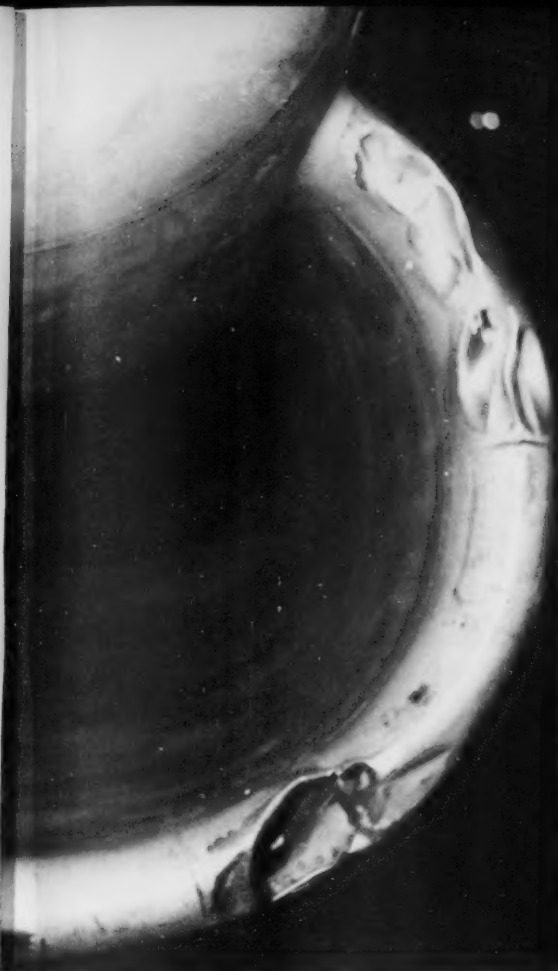
The best way to avoid the hazards of inadvertent IFR flight is to plan ahead. If you suspect the planned VFR portion of your flight to be marginal, consider whether the flight should even launch. If already airborne,

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Photos show damage to *Corsair* by impact with trees.

consider whether the flight should continue.

While the majority of flights to and from the target area (or lo-level route) are filed and flown IFR, the visual portion is where the threat of inadvertent IFR exists.

If, in spite of your best efforts, you do inadvertently enter IFR conditions, have a plan. Most NATOPS

manuals provide a procedure for inadvertent IFR flight. If your manual does not, then make one of your own, but have a plan. Be sure all members of your flight are briefed on your plan, and ensure it includes procedures for loss of flight integrity while IFR.

DON'T BE VFR WHEN IT'S NOT.





Overrotation

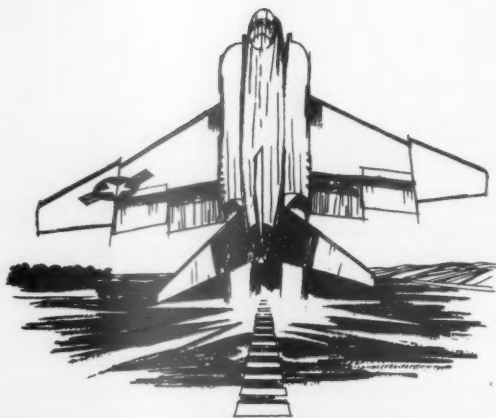
AFTER dragging the wing for 300 feet, during which time the RSO (Reconnaissance System Operator) ejected, the *Phantom* pitched nosedown and exploded. The RSO's deployed parachute was collapsed by the ensuing fireball, causing him to freefall to the ground from about 50 feet. The pilot did not attempt ejection during aircraft disintegration. Both crewmen received fatal injuries.

The RF-4B had lifted off the 14,000-foot runway after 3000 feet of takeoff roll. After liftoff, the aircraft flew 1400 feet farther down the runway in an ever-increasing nosehigh attitude, rolled right 45 degrees, and dug the starboard wingtip into the unprepared surface along the right side of the runway.

Field elevation was near 4000 feet, and the temperature was 63°F. Post-accident computations showed that the takeoff roll should have been 4200 feet with a liftoff airspeed of 168 KIAS.

This was the pilot's first attempted takeoff since deployment of his squadron to this base. There was, however, no evidence that the pilot had calculated his takeoff distance, liftoff, or refusal speed.

After a thorough investigation, it was concluded that the most probable cause of the accident was a pilot-induced overrotation and resultant loss of control. Numerous personnel, including squadron pilots, witnessed the takeoff and impact from various locations on the field. All agreed that the aircraft appeared to be in a half-flap configuration with both afterburners operating from liftoff to initial impact. All witnesses estimated that the liftoff occurred after 3000 feet of



roll.

The following *warning* appears in the F-4 NATOPS, after the paragraph entitled, "Takeoff Technique"

"From 30 knots CAS below takeoff speed until the aircraft is normally airborne, rapid aft stick movement may cause overrotation with resultant stalled flight condition, liftoff prior to reaching safe flying speed, or the stabilator striking the runway . . ."

Accident Not Unique

A review of past accidents of this type reveals that five additional *Phantoms* have been lost since January 1966 as a result of overrotation and early liftoff. This

average of one per year appears pointless . . . in no case was there evidence that *any* of the crewmembers involved had computed takeoff speeds and distances from the charts provided in the NATOPS pocket checklist.

Traditionally, Navy and Marine F-4 units have largely bypassed this procedure because of the aircraft's excellent thrust to weight ratio. Under certain gross weight and ambient conditions, the aircraft approaches or even exceeds a one to one thrust to weight ratio. Here, a premature and extreme rotation will convert part of the thrust vector to a strong vertical component that can launch the aircraft (Apollo style) 30 knots below stall speed. Once airborne, the induced drag cancels out excess thrust.

Obviously, without excess thrust, the aircraft cannot accelerate; and without acceleration, it cannot develop excess thrust. Therefore, it remains on the backside of the power curve with only the narrow margin of increased lift due to ground effect holding it up. The pilot at this point is merely along for the ride trying, as one test pilot noted, to balance a ball bearing on top of a needle point. This rather basic aerodynamic point is obviously applicable to aircraft other than the F-4.

Computing Takeoff Speeds and Distance

Computing takeoff speeds and distances will not, in itself, ensure a book-type takeoff. However, it may at least instill in pilots a greater awareness of aircraft performance and capabilities. In past accidents of this type there is evidence that lack of experience was a factor. The average flight time of the six pilots involved was 600 hours. Five of the six had a total of *less than 175 hours* between them.

Recommendations

The Naval Safety Center has submitted a recommended change to General NATOPS (OPNAVINST 3710.7F) to require:

(1) That all Navy and Marine Corps air stations adopt a procedure to include a space on the DD-175 to enter takeoff speeds and distances to be completed by pilots of high-performance, fixed-wing aircraft prior to clearance approval.

(2) That all high-performance, fixed-wing aircraft squadron commanders require pilots flying under local flight schedules to compute takeoff speeds and distances prior to manning aircraft. ◀



By Erna V. Rice
Naval Safety Center

A paper on this subject authored by Erna V. Rice, Safety Analyst, and CAPT Earl H. Ninow, MC, USN, then head of the Naval Safety Center's Life Sciences Department, was presented at the 1971 Aerospace Medical Association meeting.



What Would YOU Do If...

Student pilot and instructor walked away from this T-2A, each with one minor bruise, after the tiptanks ruptured and engulfed the aircraft in flames.

HAVE you ever thought about what *you* would do if one of the following happened?

- You decide to abort a takeoff (for any one of many reasons), drop the hook, start braking — a tire blows and you swerve off the runway, sideswipe a gravel pile and bounce over a ditch . . .

- Takeoff roll is normal, liftoff ditto at the correct speed — but the aircraft decelerates. It settles on the runway and slides on the external fuel tanks . . .

- You blow a tire on touchdown and can't keep the aircraft on the runway — it goes into soft sand, the nose digs in . . .

- You're coming in for a landing and getting low and slow. You add power, but nothing happens, and you end up stalling the aircraft — at 250 feet above the runway . . .

The potential for these four basic situations, with innumerable variations, occurs some 500 times each year

in ejection seat aircraft during takeoffs and landings.

So you have a choice. Are you going to eject — or stay with it? The decision is up to you — and you alone — and there's no magic formula to help you make up your mind.

But, here's the picture of what has happened in the past — to give you an idea of the survival probabilities, based on the course of action you choose.

In a 4-year (CY 1968-1971) study of these mishaps, it was found that 15 percent of the aircraft didn't make the runway, or left the runway, or the crews ejected over the runway or field on takeoff or landing. We divided these accidents into two basic groups — *takeoffs* and *landings*. Each of these was subdivided according to where the emergency occurred — *on* or *over* the deck (runway), and further subdivided according to what the pilot did — *ejected* or *stayed with it*. (Tables 1 and 2 show what happened by model aircraft.)

Continued

Table 1.

AIRCREW SURVIVAL TAKEOFF ACCIDENTS

Acft.	On Deck Emergency				Liftoff Emergency			
	No Ejection		Ejection		No Ejection		Ejection	
	Surv.	Fatal	Surv.	Fatal	Surv.	Fatal	Surv.	Fatal
A-4	10	—	5	2	1	—	7	—
TA-4F	—	—	5	—	—	(1)	3	—
A-5	2	—	2	—	—	—	—	—
A-6	—	—	—	—	2	2	—	—
A-7	—	—	—	—	1	1	2	—
F-4	7	—	(1)	—	—	—	8	—
F-8	3	1	—	—	—	—	4	2
F-9	9	—	1	—	1	3	3	3
T-2	2	—	—	—	4	—	2	—
OV-10	1	—	—	—	—	1	—	(1)
TOTALS	34	1	14 (1)	2	9	8 (1)	29	6 (1)

Table 2.

AIRCREW SURVIVAL LANDING ACCIDENTS

7

Acft.	On Deck Emergency					Airborne Emergency			
	No Ejection		Ejection		No Ejection		Ejection		
	Surv.	Fatal	Surv.	Fatal	Surv.	Fatal	Surv.	Fatal	
A-4	[27]	18	—	5	2	2	1	—	1
TA-4F	[8]	6	—	4 (1)	—	1	1	2	—
A-5	[8]	2	—	—	—	—	—	—	—
A-6	[12]	6	—	—	—	—	—	—	—
A-7	[15]	3	—	2	2	—	—	1	—
F-4	[72]	11 (1)	3	12 (2)	(1)	—	1	6	(1)
F-8	[12]	2	—	—	—	—	—	1	1
F-9	[19]	4	—	1	—	1	—	4	(1)
T-1	[—]	1	—	—	—	2	1	2	—
T-2	[9]	7	—	—	—	1	—	—	—
OV-10	[6]	6	—	—	—	—	—	—	—
TOTALS	[188]	66 (1)	3	24 (3)	5 (1)	7	4	16	4 (2)

NOTES:

Numbers in parentheses () indicate number of nonpilots who did not follow same course of action as pilot.

Numbers in brackets [] indicate number of *additional* individuals who met the basic criteria for review but whose experiences were strictly of the "no sweat" variety.



The pilot and B/N of this A-6 needed a little help from the crash crew to crawl out of this one. No injuries, but the aircraft was a write-off.



Placement of a mishap in ejection/no ejection group was dictated by pilot action, but in the 10 cases where the second man (RIO, B/N, etc.) didn't do the same thing as the pilots, the tables were annotated to indicate what happened. Five of the 10 survived – as did their pilots. In the cases of the five nonpilot fatalities, three of the pilots were also killed. Survival of the other two pilots was pure *luck* in one case, but due to fast action (ejection) in the other.

It is evident from this study that your chances for survival are best – a whopping 98 percent and 99 percent – *if your emergency develops on the deck and you stay with the aircraft*, both in takeoff and landing accidents.

Emergencies which occurred on the deck after touchdown made up the largest group, and most of these

aircraft did nothing more than dribble off the side of the runway, some of them blowing a tire in the process. The remainder experienced some wild rides — they hit vehicles, ditches, fences, caught fire, cartwheeled, flipped inverted, broke off wings, ran into lakes, and skidded down embankments (to mention a few).

But cockpit structures very often remain intact even when the rest of the aircraft looks like a crunched balsa-wood model. Most of the occupants got out under their own power without any difficulty. In fact, during the 4-year period reviewed, only *nine* persons were personally assisted out of the aircraft by the crash crew because they were incapacitated or trapped. Five of the nine aircraft were inverted and five involved fire. Time to reach the aircraft after it stopped ranged from 1 minute or less (four cases) to 6 minutes (one).

Fire in the cockpit was rare. In one case, the aircraft struck a strobe light, contacting a 220-volt powerline, and leaking fuel caused the aircraft to be engulfed in flames. The pilot jettisoned the canopy, jumped out through the flames, and rolled on the ground to extinguish fire on his clothing. Another aircraft (TA-4F) burst into flames on impact, and the crew got out under their own power — through the flames. In both cases, the crash crew was on the scene immediately after the aircraft came to a stop. Most fires were of the residual kind, trailing fuel fires, or tire and brake assembly fires.

The four fatalities which occurred in these on-the-deck/no-ejection accidents were due to various reasons: an F-8 wing folded on takeoff roll, and the aircraft rolled over and burned; an F-4 landed hard, the gear collapsed, and the aircraft overturned; another F-4 swerved off the runway and collided with trees in a heavily wooded area. The pilot made no attempt to eject. (The RIO did eject — too late — and was also killed.)

When ejection is indicated in an on-the-deck clutch situation, your chances of survival are still good — 87 percent on takeoff and 83 percent on landing. The secret to survival here is — **DON'T DELAY**. If you gotta go — **GO NOW!** Three of the seven fatal ejections involved *delay* in initiation of ejection. We can't make up your mind for you, but here's what happened in some of these instances:

- An A-4F left the side of the runway after touchdown, hit the midfield moreset, rolled over the top of the retracting stand, and came to rest inverted. The pilot ejected during the roll — when the wings were vertical . . . too late — **FATAL!**

- A TF-9J hit a crash truck that suddenly loomed up in front of it crossing the runway. The pilot ejected successfully.

- An A-4 landed wheels up and slid 1500 feet down the runway. As it started to leave the runway, the pilot ejected successfully — no fire, and Charlie damage to the aircraft.

The gyrations of an unmanned aircraft are, of course, unpredictable. Monday morning quarterbacking would seem to indicate that some ejections (including fatalities out of the envelope) were unnecessary because the aircraft came to a stop relatively unscathed. Other aircraft flipped over and exploded after the pilots ejected. (One pilot was caught in the fireball as his aircraft exploded.)

If you choose to eject, be sure you are within the safe envelope of your seat system. Of the seven fatal ejections following on-the-deck emergencies (two on takeoff and five on landing), four were from aircraft which were not destroyed. But malfunctions of the seat stabilization system, due to ejection conditions (deceleration), and inability of the stabilization system to perform its function due to design limitations being exceeded contributed to three of the fatalities.

Over-the-runway (or field) emergencies are definitely more hairy, but your chances for survival are far better if you eject (83 percent on takeoff, 80 percent on landing). Again — **GET OUT FAST!!!** Seven of the 10 fatalities delayed initiation of their ejection until they were out of the envelope!

Some aircraft apparently have minds of their own and think they can fly (and land) without pilots! Three of the 45 aircraft abandoned at altitudes ranging from 20 to 250 feet descended to the runway, kept on rolling (or sliding), and came to a stop upright — damaged but repairable.

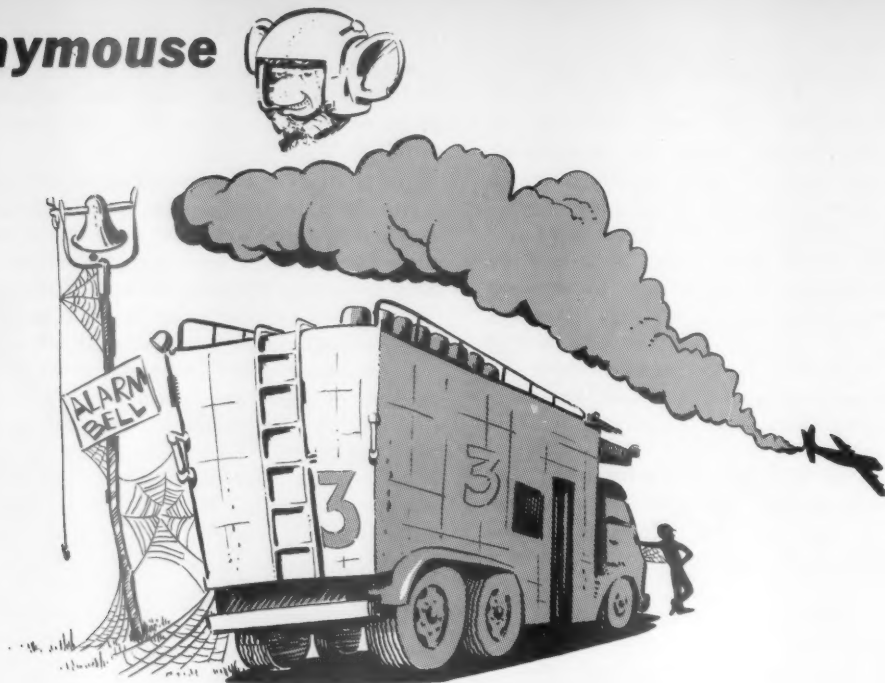
If you choose *not* to eject during a liftoff or "just before touchdown" emergency, your survival probability is 53 percent on takeoff and 64 percent on landing. Eight of the 12 nonejection fatalities were preventable — all indications are that prompt ejection would have been successful. Circumstances of the remaining emergencies precluded successful escape or survivable impact.

It is, of course, impossible to cover all the different sets of circumstances in a general overview of this kind. Each particular situation must dictate the wisest course of action. Your choice must be influenced by such factors as fuel load, type of ordnance, speed, attitude, altitude, type of terrain, and nature of obstructions in the path of your aircraft, as well as your particular aircraft's escape system parameters.

So take a look at "the odds," and then go back to the opening sentences of this article and start *planning now* what *you* would do if . . .

You could be one of the 500 this year.

Anymouse



The Day the Alarm Was Silent

10

IT had been a fairly quiet Friday afternoon, and was now 1530, the time when most naval aviators' thoughts turn to the beer muster at the club. I was sitting at my desk going over some last minute paperwork when the squadron schedules officer exclaimed, "Look, there's an aircraft on fire!" I jumped from my seat and looked out the hangar window. I saw a C-130 coming down the runway with sparks, smoke, and fire coming from around the port main landing gear. It was a beauty, too, with flames trailing 6 to 8 feet behind the landing gear, accompanied by great quantities of black smoke.

As the aircraft slowed, a station crash truck left its position on the runway and followed the aircraft until it had come to a full stop. I fully expected the crash alarm to be sounded at any moment due to the possible crisis developing on the runway . . . but the alarm was never

sounded. As the outboard engines were secured, the single crash truck pulled in front of the aircraft and remained in a standby condition. Smoke was still coming from the landing gear area, but in diminishing amounts. After the inboard engines had been secured, one of the members of the crash crew, with portable fire extinguisher in hand, sashayed over to the port wheelwell. This must have been at least 3 minutes after the aircraft had touched down and had come to a complete stop. Still, no crash alarm sounded! Evidently the single crash crew had everything under control — or did they?

The crew of the aircraft was lucky, indeed. They were lucky, considering the things that could have happened very quickly, very easily, very disastrously. They were lucky that the special landing skids were in place and bore the weight of the aircraft following a dual

tire failure. They were lucky that the aircraft did not veer off the side of the runway and into the flight line. They were lucky that there were no hydraulic leaks to feed the heated metal or burning rubber. They were lucky that the fire was contained in the wheelwell area and did not spread to the interior of the aircraft.

With an aircraft fire, you work in seconds, not minutes; and

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. These reports need not be signed. Self-mailing forms for writing Anymouse Reports are available in readyrooms and line shacks. All reports are considered for appropriate action.

**REPORT AN INCIDENT,
PREVENT AN ACCIDENT**

because the crash alarm was not activated, a second crash crew might not have arrived in time.

Anymouse

We agree. Failure to sound the crash alarm could have led to real trouble. We queried the station about the incident and they acknowledged that they had "goofed."

One of the "Little" Things

WHAT! You're going to *down* the aircraft because the rain removal system isn't working? You must be kidding!

No, I'm not kidding. I plan to down the aircraft *everytime* the rain removal system is inoperative. This is the result of a late afternoon "Fudd" launch (and night recovery) which turned into a can of wet worms due to a windshield wiper that refused to function. On final, during recovery, with no rain removal, the landing area and Fresnel lens quickly turned into a mass of blurred lights. We got it down OK, but it was extremely uncomfortable, to say the least.

Any more planned night recoveries in the rain and you can bet I'm going to brush the cobwebs off the wiper switch *before* I get on final and start looking for the meatball.

Fuddmouse

An operative rain removal system is one of those "little" things which turn out to be very "big" when you really need it.

Two Wrongs Can Make A Right

SOME time ago in APPROACH you had an article that said two wrongs don't make a right. Here's a set of circumstances to belie that "fact."

After extended hover practice and many landings, we departed NAS for a local area fam. Some

miles from the field, a red warning light necessitated a precautionary landing. The pilot maneuvered the helicopter into a grass field while the copilot broadcast their intentions to the tower and a nearby playmate.

The landing was uneventful, and the helo was shut down. The pilots congratulated themselves for remembering to lower the landing gear. However, their "attaboys" proved inappropriate.

It's true the gear was down, but only by luck. It seems that *both of them forgot* to raise the gear when we left NAS, and *both forgot* to lower the gear before the emergency landing. Moral: Don't plan on being lucky, *use the checklist.*

Oh, my!

Anymouse

Tempo of Ops

DURING a period when the tempo of ops increased at my base, I had the opportunity to observe a

practice that was as ridiculous as it was unsafe. A C-1A was being "high-powered" with three maintenance men standing within 5 feet of the turning prop — wearing *no sound suppressors*. However, this was not the ridiculous, unsafe practice . . . one of the men, a CPO, was standing inside the prop blast, while the engine was at a very high power setting, performing maintenance on the engine. I don't know what the prop blast velocity is for a C-1A, but I don't think the Navy pays anyone enough to stand in it.

The solution to this problem is obvious. Everyone, including experienced supervisors, must adhere to standard safety practices. When the tempo of operations increases, we must be especially cautious. Limbs and lives are too valuable to lose because of poor headwork.

Observermouse

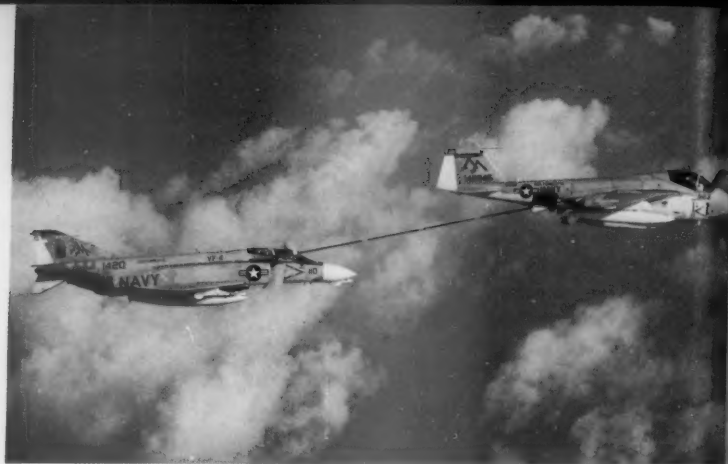
Well said.

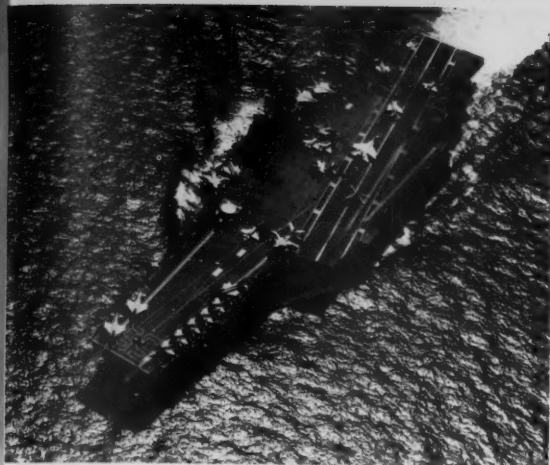
11



A
Brief
Look
at

The Ship / Air War





Carrier Air Wing Team in Action

WE often speak of safety as an abstract concept, but at least one segment of the Navy — our carrier/air wing team — has made safety a way of life.

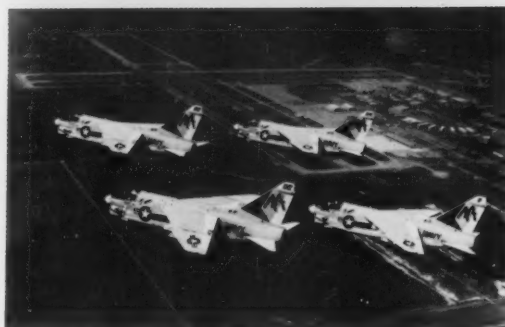
A recent predeployment at-sea period for FORRESTAL and embarked Attack Carrier Air Wing 17 provided an APPROACH reporter with the opportunity to see a ship/air wing in action. It was evident to this reporter that safety is the byproduct of doing every job right. There's a word for this — it's called professionalism. It aptly applies to the operations which our reporter witnessed.

There is a good reason for the realistic — if not always enthusiastic — acceptance of the restrictions and effort which safe operations demand. First, it ensures, insofar as possible, the safety and well-being of the officers and men, but equally important, *it is the only way to do an incredibly demanding job with any degree of efficiency.* Imagine, for example, the chaos and inefficiency — not to mention the personnel hazards — when precise deck operations are marred by a serious accident.

The *potential* for accidents is everywhere. This is a fact of shipboard life. There's the ship itself. It's a complex and compact conglomerate of equipment. Space permits only the most superficial mention of



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machinery — the propulsion plant, electrical, water, and hydraulic systems, the elevators, catapults, arresting gear, barricades, jet blast deflectors, radars, antennae, rolling stock, etc., ad infinitum. Add to this thousands of tons of supplies (including ordnance and volatile fuels), scores of high-performance aircraft, and thousands of men, and you begin to see that the effectiveness of the ship/air wing entity is a direct function of the efficiency — the professionalism — of all hands.

A ship/air wing team does not become an effective fighting force overnight. It takes time — training time — and it remains fully effective only so long as the training continues.

Much of the training takes place in training commands, fleet functional schools, and readiness training squadrons; but the final integration of all elements and the polishing takes place aboard ship. Consequently, shipboard life is a never-ending series of drills and exercises. Here, the time for bookwork is mostly past, and the emphasis is on doing — on performance. Drills and exercises range from checkouts of machinery and equipment to carrier qualifications and a continuing series of tactical operations, including the frequent call to general quarters.

Communications is the ingredient which oils this complex entity. With so many operations going on

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simultaneously, there is a need for split-second timing. This need is met by a wide range of communication equipment ranging from the public address system, which can reach every nook and cranny within the ship, to radar repeater scopes, radios, engine order telegraph, sound-powered phones, and light/sound signals. This system ties together such diverse elements as the bridge, pri-fly, LSO platform, CIC, hangar deck/flight deck control, and damage control central.

The ship's commanding officer can most always be found on the bridge observing and communicating. During the course of an average day, he will issue many direct commands, but few of these are equal in importance to the leadership function which he fulfills. Staff meetings, sure, but FORRESTAL's captain obviously relishes direct leadership. During this at-sea period, he was often on the public address system, beginning, "FORRESTAL, this is the captain speaking..." Thereafter, he would address all hands on the problems of the day, the future outlook for the days ahead, an assessment of the ship's performance during drills and exercises, a word now and then about the way operations must be conducted... in short, a professional communicating with professionals about how best to ensure a professional performance by the ship/air wing team.



Have you ever wondered how to get material published in APPROACH?

Here's How It Works

A STAFF of military and civilians write stories for, lay out, and edit each issue of the "slick" publications (APPROACH, MECH, and FATHOM) produced by the Commander, Naval Safety Center.

The staff is constantly on the lookout for interesting safety articles of value to naval aviation when reviewing squadron aviation safety newsletters, station newspapers, and numerous military and civilian safety-oriented publications. Frequently, articles are reprinted or adapted (revised or reworded to fit Navy circumstances or lingo). Credit is always given to the source from which permission to reprint is obtained, and to the author, when the author is clearly identified.

Occasionally, a squadron which produces its own aviation safety newsletter will have an article picked up by another publication. Should the Center reprint from such a source, the squadron will get credit *only* if it is identifiable. The

policy of the Center is to give all possible credit to individual authors, to their unit, and publishers. Where *original* sources and/or authors are not credited, it is simply because they are not known or cannot be positively identified.

As an example, several Marine and Navy groups produce, locally, excellent aviation safety newsletters. Some we get regularly, some we don't. For instance, each MAW produces aviation safety publications which are received regularly by NAVSAFECEN. If a squadron publishes an article in its newsletter that subsequently appears in the MAW publication and reappears in APPROACH, the source is identified as MAW, and credit is given accordingly. If the author is known, a byline is given with the title.

Magazines, newsletters, and the like received by the Center are routed to those persons cognizant of the material contained.

Unfortunately, *all* publications and newsletters are not received by the Center, and of those received, all cannot be reviewed by the Center's writing staff.

Periodically, the Center solicits a request for safety materials (and photographs) that are pertinent, i.e., have a mishap prevention message.

You can help the system by writing the Editor a letter and enclosing any article you may have or by identifying some article, its author and location for possible use in APPROACH. Write an Anymouse. Send a copy of your squadron newsletter direct to the Editor. If none of these methods suit you, call on Autovon, 690-1321, and ask for one of the writers. He'll jump at the chance to help you get anything that's suitable into an issue of APPROACH (MECH, FATHOM, or LIFELINE, for that matter) and give credit to you and your unit.

It's our business to help our readers. ▶



TWELVE INCHES TO TOUCHDOWN

AIRPORTS with dual runways sometime become saturated with moving aircraft. It is not unusual on days when the wind is light and variable to have traffic landing on crossing runways simultaneously, as well as departing traffic and taxiing traffic, to the casual eye, going every whichaway.

Pilots who operate out of such airports (O'Hare, Kennedy and others) know that precise control of traffic is in existence but they operate cautiously — just in case.

One pretty day at a military airport, which also serves the local community as the commercial field, three aircraft were in the traffic pattern. A heavy commercial jet was making approaches on 4L in a left-hand pattern. A Navy patrol plane was shooting touch-and-go's on 4R in a right-hand pattern, and a light civilian aircraft was cleared to land on 36. The wind was north at 16 knots.

On the third approach of the patrol plane the IP, who was training a new pilot, commenced a waveoff because of the clearance given to the light plane. The tower controller was advised of their intentions and he cleared the patrol plane downwind from its position — just turning final.

The trainee added power and started a turn. He did not raise the gear nor ask for gear up. The IP assumed he would leave the gear down since they had, in effect, been cleared for a 360. The IP instructed the trainee to make a right 360 and did not notice the gear was later raised in the turn. The trainee continued his turn and the IP kept a sharp lookout for the commercial jet and any other traffic throughout the turn.

The patrol plane had been set up for a simulated one-engine-out approach and landing. As the trainee rolled out onto final he had minor problems keeping it straight because of the crosswind. The wheels watch on 4R failed to give any signals as the aircraft passed him. However, the tower controller did! He saw the plane, gear up, cross the threshold and hollered — almost in time. A waveoff was initiated and the crew later reported they felt the aircraft hit as the plane accelerated. The pilots did not feel any impact and they returned to Homeplate.

Twelve inches, exactly 1 foot, was the difference between this incident and substantial damage or even a complete wipeout.

Interruptions in the landing pattern, *particularly when a waveoff is executed*, should cause every pilot's caution lights to flash, horns to blow, and pucker factor to hit the redline *before* the next landing is attempted — to ensure *positively* all landing checklist items are covered.

What's a guy to do?



"WELL, howin' hell do you figure that?" said the HAC to his copilot. The question was a natural one after the pilot had completed a night autorotation when both engines flamed out.

The maneuver ended in a shallow pond, 18 inches deep. It had been executed so expertly that three of the eight souls onboard slept through the whole thing.

The HAC's question was half rhetorical and half serious because both he and the copilot were looking at the UH-46A fuel gages which read 195 pounds port and 150 pounds starboard. To add to the mystery, when their flight ended so unceremoniously, they had only been airborne for 1.8 hours — cruising at 120 knots.

Now most pilots flight planning the H-46 can tell you the *Sea Knight* with a max fuel load can be flown at 120 knots for 2.0 hours at the outside — allowing only for minimum ground time.

The crew was in one of three aircraft on a night cross-country from Midpines to Fleetville. Originally they had filed via Halfway to refuel. An hour out of Midpines, a speed-check showed they were 7 minutes ahead of schedule; and a fuel-check revealed they could all make it nonstop to Fleetville.

The flight leader changed their flight plan with flight service, and the three H-46s made a slight change in

heading to proceed direct. Their weather was clear, forecast winds were light and variable, and the air was smooth. It was strictly no sweat.

Thirty minutes farther down the road one of the wingmen advised the leader he wasn't going to make it. His fuel gages showed a couple of hundred pounds less than the other two. So the leader detached him and the other wingman to a lighted but unattended airport at Shorepoint. The leader advised the two wingmen he would continue to Fleetville, get some petrol, and bring it back.

The two wingmen whirled away for Shorepoint, and the leader advised Fleetville Approach what was taking place. At this time he recomputed his fuel and noted he had enough to reach Fleetville with a minimum reserve of 20 minutes. Let's digress momentarily to point out that the pilots and aircraft had been in the squadron for many months. There were neither neophytes nor new machines flying that night.

At a point just 5 miles from an AFB and only 8 miles from Fleetville, the HAC sensed one of the turbines beginning to unwind. (Oh! Oh!) His copilot relinquished the controls at the HAC's command, and the HAC nosed over.

Between the time the HAC took over and a



millisecond later, the other engine quit. Even though he had already reduced collective and nosed over, *drag on the rotor system was so great he lost turns below 88 percent. Like now!*

When that happened, he lost his generators and SAS (Stability Augmentation System). The rest of the descent was a wallowing dive for the deck. He was able to build up his speed to 100-120 knots and, thanks to some lights of a nearby community, had enough reference to start a flare.

Earlier, prior to takeoff, he had preset the landing lights — not expecting to use them. However, when he started his flare, the copilot turned on the lights to reveal rocks, stumps, and all kinds of debris in front of them. The HAC used his speed to balloon just enough to clear the junk, completed his autorotation, and settled gently into the pond. (Whew!)

Just to keep readers from wondering what happened next, be advised they spent the night where they landed, took on fuel the next morning, and all three helos reached Fleetville — late but safe.

Well, sir, a lot was said about the decisions made that night.

The HAC had been flying single boost, with crossfeed open, balancing fuel tanks when the left tank ran dry.

Instant dual flameout. (Sob.) Otherwise, he might have made it single-engine to the AFB. The HAC was berated for improper flight planning and fuel management. Whether you agree or not is immaterial; he did run out of fuel, *Ipso facto*, poor headwork.

Let's review the bidding. The HAC's decision to continue to Fleetville was based on: his known groundspeed (he had computed it twice in flight); the forecast and actual winds (light and variable) for an hour and a half; fuel onboard (verified by the same reading as one of his wingmen); an assumption his gages were accurate (subsequent tank checks revealed that gages in 10 other squadron aircraft read only 25 pounds when the tanks were dry); and fuel consumption of 1080 pounds per hour (computed on his weight, flight altitude, and power setting for 120 knots).

As it turned out, because of gage error, he was using 1250 pounds per hour; and on the last part of his flight he had 10 knots of wind on the nose. So between the headwinds and greater fuel consumption, the HAC really wasn't doing as well as he thought. What's a guy to do?

Besides "to expect the unexpected," a real lesson for all helicopter pilots was in the immediate loss of turns when the engines stopped. Are there any helo drivers who still believe that practice autorotations are a waste of time in multiengine helicopters?

The incident was closed with the changing of SOP to require that pilots land with minimum fuel of 300 pounds per tank (EEHYYIEE! A 25 percent reserve???) and will soon be forgotten. (Maybe SOP will be, too.) ◀

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Downwind Danger

AN SH-3D pilot was cleared to make his approach along the carrier's port side and land on the bow. Wind was given as 165 degrees relative at 8 knots. An aircraft was parked on the starboard catapult and there were numerous personnel on the flight deck. It was the pilot's intention to land along the axial deck, port side. The weight of the helicopter, temperature, and density altitude were such that no problems were expected.

The *Sea King*, now about 30 feet above and to port of the carrier's deck edge, began sliding forward and to the right toward the landing spot. As his IAS slowed to about 25 knots, and with a 250-foot rate of descent, the cyclic controls became sloppy. The pilot was also having trouble holding his heading, and his rate of descent began to increase. He decided to wave off.

Initially, he lowered the collective. When he had regained rudder authority and cyclic response, he kicked left rudder and used forward and left cyclic to move away from the ship. His waveoff was successful. As the controls became effective, he raised the collective until the nose began to yaw right, then backed off a tad — using just enough to maintain heading.

During the waveoff, a maximum of 115 percent torque was reached for a second or two, and about 106 percent was held for another few seconds. This exceeded the dual engine transient torque limitations.

The HAC then requested an into-the-wind approach to the bow and made an uneventful landing.

The pilot erred by placing his aircraft in a position which would necessitate excessive torque to wave off.

His CO opined that the HAC lost translational lift and began to settle with power. Most helicopter pilots know that the only way to get out of this condition is to reduce collective and pick up airspeed. Fortunately, timely recognition of this predicament enabled the HAC to make corrections which kept him from crashing on deck or into the sea.

Crosswind or downwind landings ashore can be safely accomplished under certain conditions. However, aboard ship there are other conditions, such as flight deck turbulence and stack-gas flow, which further complicate such landings.

An important point was made by the CO when he questioned the HAC's decision to accept his clearance without requesting more favorable winds or a different approach path. A clearance, per se, should not be accepted without *some* headwork. The HAC must consider the ramifications of a clearance and decide if existing conditions will jeopardize either pilot or aircraft performance. ◀

Helo Passenger Briefings

BY virtue of their peculiar flying characteristics, helicopters rate special consideration when it comes to carrying passengers. Although these aircraft often operate under waivers not applicable to fixed-wing types, *there is no waiver of the requirement to brief helicopter passengers.* Briefing procedures, however, are slightly different than for other aircraft. Helicopter pilots and aircrews should review General NATOPS and be as familiar with these requirements as they are with their model NATOPS.

NATOPS General Flight and Operating Instructions Manual (OPNAVINST 3710.7F) is specific about who can ride as passengers (para 201 k), what items shall be covered in the briefings (para 201 d 2), passenger conduct (para 601 d), passenger restrictions (para 601 e), briefing responsibility (para 603 a), safety belt and shoulder harness requirements (para 611), wearing life preservers (para 702 a), and wearing parachutes (para 703 a 2).

Two of the most obvious peculiarities concerning helicopter passenger requirements in General NATOPS are:

- A waiver of the requirement to have a manifest of all aboard when engaged in SAR missions, lifting recco parties, etc., when there is no agency available with whom the manifest could be deposited;
- A waiver on pretakeoff briefings . . . when landings are precluded, except that *the briefing shall be the responsibility of the cognizant local commander(s).*

These waivers do not license helo crews to be unconcerned or callous about passengers, and seldom are they. Most helo squadrons, using various methods, provide passengers with information necessary to their safety and well-being. Three of the best methods are: plainly stenciled instructions in large letters on the helo bulkheads; placards which can be handed to passengers containing general safety instructions, emergency escape routes, and emergency exits; and personal briefings by the flight attendant. Examples of stenciled information and placards are shown in Figs. 1, 2, and 3.

Helicopter passenger briefings should include such important items as: the proper paths to approach and depart the aircraft — particularly if the rotor blades are turning; tail rotor hazard; wearing survival gear properly;

strapping in correctly and remaining strapped in until the flight attendant directs otherwise; direction of escape routes and location of exits; and the hazards of inflating lifevests inside the aircraft.

COMNAVSAFECEN is coordinating with several commands in producing audio-visual aids for helicopter passenger briefings. Simultaneously, a briefing pamphlet (similar to the *Sense* pamphlets), briefing cards and placards are in production.

Passenger Ditching Procedures (TYPICAL HANDOUT)

- (1) Remain calm, the crewman will assist you in every possible way.
- (2) Remain strapped in tightly until you are told to exit the helicopter, then move to the nearest exit and depart rapidly.
- (3) Follow the dashed lines (diagram) from the numbered seats to the exit indicated.
 - a. Push windows out.
 - b. To jettison the door, turn yellow handle marked "EXIT RELEASE."
 - c. To jettison the cargo hatch window turn the yellow handle marked "EXIT RELEASE."
- (4) *Do not* inflate your Mae West until you are outside the aircraft.
- (5) Orientation straps are installed to assist you in locating an exit. If necessary, pull yourself along the strap to an exit.
- (6) Remain seated and strapped in at all times unless otherwise directed.

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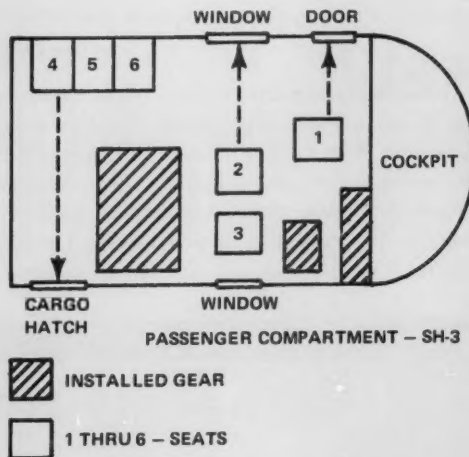


Fig. 1

HC-6 Helicopter Passenger Briefing Instructions

Note: Personnel to be transferred from a ship *shall* be manifested and *thoroughly* briefed before departure.

Brief:

1. Lifejackets will be donned prior to takeoff, or prior to getting into the helicopter sling for transfer from a ship at sea. Inflatable, rather than Kapok, lifejackets shall be used to permit exit from an inverted or submerged helicopter. Lifejackets will normally be provided by the helicopter crew.

WARNING

The rotor blades are deadly. When entering the helicopter on deck, keep low and enter through the door as directed by the helicopter crewman.

2. When being hoisted in the rescue sling, place the bottom of the sling under the arms and across the back. The sling should be held with the arms folded over the chest enclosing the sling. With the sling properly donned, even an unconscious person will not fall out. As the person approaches the door, he should not attempt to climb in or grasp the helicopter. The crewman will face him outboard, hook an arm around his middle or grasp the sling at his back, and draw him into the helicopter. (In the H-46, the person will face inboard and will walk up the steps into the helicopter, assisted by the crewman.)

3. When seated and strapped in, the passenger should orient himself with respect to *all* emergency exits. These exits are outlined in yellow and have stenciled opening instructions in the area. Operating procedures vary with different helicopter models and can be:

- a. A pull "T" handle, or
- b. Turn and pull or push handle, or
- c. "Pull tape for exit" type.

If the proper operating procedures are not clearly understood, ask the crewman to demonstrate and/or explain.

Note: No Smoking. Request permission from crewman before smoking.

Note: Seatbelts shall remain fastened at all times, unless otherwise directed.

In Case of a Crash or Ditching

1. Stay strapped in until the rotor blades and aircraft motion have come to a complete stop.
2. If the aircraft remains upright, unstrap and proceed calmly to the nearest exit as directed by the crewman. After entering the water, inflate your lifejacket.
3. If the aircraft rolls inverted, do not panic; remember that the door is still in the same relative position from you. Unstrap and move to the door. After leaving the aircraft, inflate your lifejacket.
4. Once comfortably floating on the surface, follow the directions of the helicopter crew.
5. If the aircraft crashes on land, exit the aircraft only after all motion has stopped. Get well clear.

Fig. 2

Passenger Safety Instructions

HC-6 welcomes you aboard the H-46 Boeing-Vertol *Sea Knight* helicopter. Please *fasten seatbelts* and *don life preservers*. Crew chief will instruct you on the adjustment of the seatbelts and the wearing/operation of life preservers.

A. *No smoking* during takeoffs, landings, or while on deck. When airborne, request permission from crew chief before smoking.

B. *Seatbelts* will be fastened before taxiing and will remain fastened until landing.

Although we do not expect any difficulty, we are required to brief passengers prior to each flight in the event of an emergency.

EMERGENCY PROCEDURES – Exits in the passenger area may be used for escape. All are outlined in yellow and have opening instructions. The exits are: the main door (starboard side, forward); emergency door (behind raft on port side); 3 emergency window exits (2 starboard, 1 port); and the ramp (aft section of aircraft) as shown in the diagram.

DITCHING INSTRUCTIONS:

1. Do not unfasten seatbelts until advised by the crew chief.
2. Do not evacuate helo until rotors have stopped.
3. Never activate life preserver until clear of aircraft and rotor blades.

- | | |
|-------------------------------------|---|
| 1. Pilot's Jettisonable Door | 9. Rescue Hatch |
| 2. Cabin Entrance Door | 10. Cut-Out Panel Markings (Both Sides) |
| 3. Sea Anchor Stowage | 11. Fire Extinguisher |
| 4. Escape Hatch | 12. Emergency Exit Door |
| 5. Escape Hatch | 13. Copilot's Jettisonable Door |
| 6. First Aid Kit | |
| 7. Rear Loading Ramp and Cargo Door | |
| 8. Escape Hatch | |

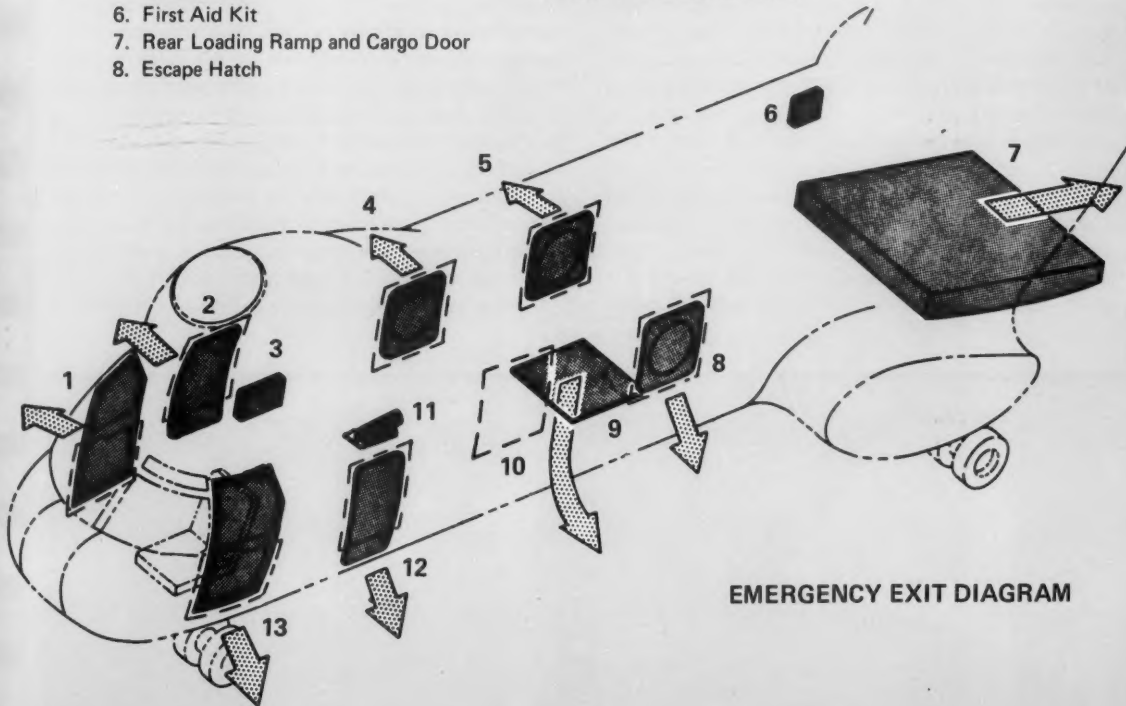


Fig. 3

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Continued

YESTERDAY

By LT Ted Shown, USN

Exploitive Films Hollyfield, Calif 09090

CDR John C. Toobusy
Commanding Officer
Navy Squadron
NAS Homeplate, USA

Dear CDR John C. Toobusy:

Talent scouts from Exploitive Films have been observing your squadron for several weeks. Their reports have been boff-o, John baby. I want to make you, and some of your crew, into STARS! Who knows, one or more of you might be signed to long-term contracts after this exposure. Of course, there's the other side too — you *might* bomb.

Let me explain the gig. Exploitive Films is in the business of exploiting people, places, organizations — anything to make an honest buck. Things in the pornography business have slowed to a crawl, so we have decided to move into the safety

business with a bang, if you know what I mean. None of these stuffy old films that your troops have been seeing and sleeping through (the ones you were too busy to attend). None of the soft type films where some clumsy actor tries to recreate the accident that happened in real life. No sir! Exploitive Films is going to film the real thing.

Now, to get to the point. After considerable study of your squadron, we are convinced that we can film your normal activities and have a better than even chance of filming an accident. Just last week one of my field agents heard a chief of yours say, "This squadron is long overdue for an accident." We'll start with a little introductory stuff. Maybe a shot of your ordnancemen throwing those harmless little primers around, when they have nothing else to do. We want to get some shots of mechs routinely working on engines while standing on those flimsy stepladders they use. We also want to shoot your senior officers lecturing on NATOPS, then fade to the cockpit with the same guy getting ready to fly without any real regard for the procedures.

Sooner or later we'll get the accident itself on film.





However, we don't intend to merely film the mishap. We'll want to follow the pilot to the dispensary – a little blood and guts, you know. If we're lucky enough to shoot an accident with aircrewmembers aboard, we would fade to the man's training jacket to show how his supervisor and division officer gundecked his safety training for the past few months. We'd like a shot of your men throwing darts during a safety standdown, and perhaps we could get some on-the-spot footage of your pilots drinking beer at the club for lunch before an afternoon flight.

If we're lucky enough to have an aircraft crash at Homeplate, we'll superimpose, over the burning wreckage, a shot of you giving the ill-fated pilot answers to a recent surprise CAG NATOPS test.

For the big ending, we'll go home with some accident victim (if he's able to go home). We want to do this for the human interest angle, you know, to get his wife's reaction to the sight of her husband holding the wedding ring she had given him, which used to be on the finger, which was torn off when he . . . A scene like that would really help sell the film.

Not very much is required of you, skipper. Just keep up business as usual. Don't be overly concerned by safety. However, we do ask you to keep your ASO in check. All JOs are a little idealistic you know. We do expect you to cover yourself, but there's no need to go beyond that, no need to get too involved. We certainly wouldn't want any shop supervisors to make the men take off their rings when working, or to insist that the men wear safety shoes, or wear safety goggles when working around grinding machines. It will be a lot more realistic for the officers to continue looking the other way when they see safety violations.

One last point. We won't be able to pay you or your men, skipper, but all of you will have the satisfaction of seeing the completed film first – a world premier if you will. I know that way down deep inside, you'll have the personal satisfaction that you were responsible for the whole thing.

Sincerely,

Max
Max Footage
President





EVERY naval aviator knows that each flight requires certain preparations to ensure its successful completion. The advent of winter simply adds to those preparations by creating unique conditions not encountered during the warmer seasons.



approach/november 1972



When Winter Comes



Planning Flight Operations

One of the first requirements for successful winter flight operations is, *to know your aircraft as thoroughly as possible*. Review the operation of all aircraft systems which are required by, or might be adversely affected by cold weather — well in advance of intended flights. Dig deep into NATOPS (and the Maintenance Instruction Manual, if necessary) to get a complete understanding of these systems.

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Start your cross-country flight planning early by requesting an extended weather forecast from meteorology several days before your departure. Be aware that wind patterns shift with the seasons. The jet stream, in particular, shifts to the south during winter months, increases in velocity

and drops to lower altitudes. This usually means shorter legs between fuel stops, westbound.

Spend some time studying destination and enroute airfields in detail. Approaches may have to be made in conditions of poor visibility. Snow on the ground may blot out or distort the appearance of many landmarks. While looking over the airfield layout, pay particular attention to the location and type of emergency field arresting gear. Also, carefully note any obstructions which may



present a hazard to flight or ground operations.

Before filing your flight plan, give it a last minute, but very careful, review — this time with the benefit of up-to-the-hour weather information.

Give the NOTAM file a careful check. It may be that one or more runways at your destination have been closed because of snow and ice (many airfields attempt to keep only the main instrument runway open during heavy snowfalls). Keep in mind also that as valuable as NOTAMS are, they will not always provide advance warning of field closings.

If the existing wind and weather at your takeoff point or destination is marginal, reconsider whether the flight should be made at all. If you happen to have an aircraft with critical crosswind characteristics, it may be that takeoff is not warranted.

Conduct a thorough preflight before takeoff to ensure that your aircraft is ready in all respects. Ensure that all surfaces of the aircraft are free of frost, ice, and snow. Any of these deposits will change the aerodynamic shape and/or characteristics of the airfoils, raising the stall speed and increasing the takeoff roll. The best and safest course is to ensure *complete removal* of all deposits prior to takeoff.

Ensure that pitot tubes, static ports, and fuel tank vents are free of ice and snow. Before starting engines, ensure that they are not frozen or hydraulically locked. Consider preheating engines before start, particularly in the case of propeller aircraft. Generally, if the outside air temperature is 20°F or lower, props, recip engines and oil



systems should definitely be preheated.

Start engines (recips and jets) with external power whenever possible. After start, check for proper oil pressure, and generator/battery output.

Use Care During Taxi

Due to obliteration of markings on the ground, other aircraft may not be parked correctly. While taxiing, taxi slowly and lead into turns. Brakes may be almost totally ineffective on icy surfaces. If yours is a multiengine aircraft, use differential power for turning — but carefully.

Takeoff

Directional control can be a problem during takeoff. Braking for control until rudders become effective can be particularly hazardous. A wheel that is locked and

skidding on ice, suddenly crossing a dry spot of runway, can cause a blown tire, or worse, a violent swerve. If there is snow, slush, or water on the runway, expect a longer takeoff roll.

After takeoff, if conditions permit, make a slight delay in retracting the gear. This will permit the wind to blow excess water and slush off the landing gear. Likewise, cycling the gear after retraction will minimize the possibility of landing gear or landing gear doors freezing in the retracted position.

If you must climb through altitudes where icing conditions exist, do so as rapidly as possible to minimize ice accumulation. Plan your cruising altitude to stay clear of icing. If you encounter icing, request a change of altitude as soon as possible, regardless of type aircraft.

Turbojet Engine Icing

Turbojet engine icing can become a problem. Ice can form over inlet guide vanes causing a restriction in air flow, resulting in reduced thrust, increased tailpipe temperatures, excessive turbine temperatures, and possible turbine failure. For a given engine, the rate of ice accumulation is approximately proportional to the intensity of the atmospheric icing condition and the air flow through the engine; the air flow being generally proportional to engine RPM. The rate of engine icing, therefore, may be reduced by lowering engine RPM.

Lengthy studies pertaining to icing characteristics of clouds show that in stratus (layer type) cloud formations, the icing region can extend for many miles horizontally. For cumulus type cloud formations, the



depth of icing is considerably greater than the horizontal dimension. Therefore, whenever operational conditions permit, the general rule should be to change altitude (climb or descend) when encountering layer cloud icing and vary course, as appropriate, to avoid cumulus cloud icing.

* Carburetor Icing

This is a most treacherous ice accumulation type which frequently causes reciprocating engines to fail without warning. It may form under conditions in which structural ice could not possibly form. If the relative humidity of the outside air being drawn into the carburetor is high, ice can form inside the carburetor in cloudless skies and with the temperature as high as 25°C (77°F). It is most serious when the temperature and the dew point approach 20°C (68°F), but pilots should be alert for it any time the relative humidity is high. Ice sometimes forms with outside air temperatures as low as -10°C (14°F).

The carburetor heater is an anti-icing device which preheats the air before it reaches the carburetor, melting any ice or snow entering the intake and keeping the mixture above the freezing point. The heater is usually adequate to prevent icing, but it *will not always* clear ice which has already formed. During long glides with closed throttle, the carburetor heater may not prevent icing unless the throttle is opened periodically to keep the engine warm.

The Approach

As you approach your destination, don't be too eager to ask for or accept an enroute descent unless you are sure that it will not result in excessive fuel consumption or prolonged flight in icing conditions. Recognize that a low approach in icing conditions in tactical jet aircraft constitutes an *emergency approach* and should not be attempted if other alternate courses of action are available. Before commencing descent, ensure that defrosters are turned on in time to prevent canopy frosting during the penetration/approach. Monitor engine instruments carefully during descent. If the aircraft has accumulated structural ice, make allowances and maintain adequate flying speed. Turn off the deicer boots before the final portion of the approach, since they deform the leading edges of the wing and cause an increase in stall speed.

Be prepared to locate the runway when you break out, bearing in mind that snow may mask or distort its appearance. Instead of that 150 to 300-foot wide runway you are looking for, you may see what appears to be little more than a horse and buggy trail across a white field.

* FAA/Dept of Commerce publication, *Aviation Weather*.

Landing and Rollout

Plan your touchdown point and landing speed carefully. After touchdown, there are three *normal* methods of stopping the aircraft: aerodynamic drag, wheel braking, and reverse thrust.

One of the most likely problems to be encountered in getting stopped during winter conditions is hydroplaning. To briefly review the subject of hydroplaning, there are two types: dynamic and viscous. *Dynamic* hydroplaning (where the water lifts the tire completely off the runway surface) results in an almost complete loss of contact between the wheel and runway surface and virtually complete loss of braking effectiveness. *Viscous* hydroplaning, on the other hand, occurs at a much lower groundspeed than dynamic hydroplaning and requires only a thin film of fluid to be present on a smooth surface.

The effects of dynamic hydroplaning (the most commonly encountered of the two types) can be partially overcome by making maximum use of aerodynamic drag for braking. These drag effects are greatest during the first part of the landing roll (when the effects of dynamic hydroplaning are worse) since drag varies directly as the square of the aircraft velocity. Therefore, maximum use of aerodynamic braking should be made as soon as possible after touchdown. The aircraft should be rotated to the highest permissible angle-of-attack, maximizing induced drag (if authorized by NATOPS). In addition, all available drag devices (drag chutes, speed brakes, spoilers, and flaps) should be used unless prohibited by NATOPS.

Wheel braking should not be commenced until the maximum benefit has been obtained from aerodynamic drag. When wheel braking is attempted, its effect will depend upon the coefficient of friction between the runway surface and the tires, and the proportion of the aircraft's weight on the braking wheels. A dry, clean, concrete runway will provide the best coefficient of friction; but water, ice, etc., will reduce braking efficiency dramatically, perhaps by 75 percent — or more.

When you have the aircraft under control and have turned off the runway, use extreme care in taxiing so as to remain on the taxiway and clear of obstructions. This is where your knowledge of airfield layout (prior study?) will be especially valuable. Beware of snowbanks.

Give Winter Some Thought

Remember, with adequate preparation, many of the problems associated with winter weather can be minimized or eliminated entirely. The emphasis is on *planning*.



The Isolated Case

By H. P. Osman

A RECENT article in a popular monthly magazine began with "Epidemics Ahead — Unless!", and dealt with the topic of *preventable diseases*. Basically, it explained that many people neglect to do something about the unnecessary spread of communicable diseases through ignorance, apathy, or just plain laziness. Unfortunately, this type of negligence can also be found in the military services, including the naval aviation maintenance community.

You in aviation maintenance can help prevent the spread of "communicable diseases" (material failures/malfunctions) by reporting via the UR method all those incidents which may seem to you to be insignificant, isolated "cases." When in doubt — report it, and let a professional analyst make the final judgment. When the isolated cases have all been reported to a central focal point, such as NAVSAFECEN, a review may prove it to be *anything but* an isolated situation.

Such diligent UR reporting should be carried out, not only by those in naval aviation, but also by those who function in other areas of the Navy, as long as their actions touch upon the lives and safety of naval personnel or material. Be it in traffic, industrial, aviation, surface, submarine, or other areas, the Naval Safety Center is interested in promoting safety-alertness and in the reduction of mishaps. Help us help you — send in those URs. ➤

Double Trouble

Twenty-seven minutes after takeoff, the *Intruder* crashed!

BOTH engines had flamed out from fuel exhaustion — *even though there was still more than 9000 lbs of fuel aboard the aircraft.*

Here's the story:

The EA-6A was configured with ECM pods on stations 1 and 5 and 300-gallon drop tanks on stations 2 and 4. Gross weight was approximately 50,000 lbs. Reported weather at takeoff was 500 foot broken, 1000 foot overcast.

After takeoff, the pilot was unable to raise the landing gear handle. He was aware that the aircraft has an override switch which will permit the gear handle to be manually raised. However, the pilot had to "go on the gages" at about 700 feet and decided not to use the override since it required the use of both hands.

Deciding to abort the flight, he leveled off at 1500 feet and requested radar vectors around the field to a GCA pickup. Clearance to make a low pass after his approach and then remain VFR for a final landing was denied because the field was IFR. However, clearance was given for a low pass so tower personnel could visually check his landing gear, after which he would be

radar-controlled for a full stop.

Cleared for a left downwind, he placed both the wing and fuselage dump switches to DUMP to reduce aircraft weight below 45,000 lbs, maximum landing weight.

The pilot was unable to get lined up properly on the first approach. While being vectored for a second approach, the crew observed illumination of the low fuel warning light on the annunciator panel. The pilot secured the fuel dump switches and checked his fuel quantity. According to his statement, the totalizer showed over 10,000 lbs of fuel, and the fuel quantity indicators showed 5000-6000 lbs in the fuselage and 3000-4000 lbs in the wings. Since the low fuel light is designed to come on when there is 1900-2200 lbs of fuel remaining in the fuselage tank, the pilot concluded the low-level fuel light indication was erroneous.

The pilot apprised approach control of the low fuel warning light, but did not declare an emergency.

Shortly after beginning descent on the second GCA, the right engine low fuel pressure warning light illuminated, and the right engine RPM gage confirmed a power loss. This was followed by identical indications and loss of thrust from the left engine. The EMCO

ejected at 1300 feet. The pilot ejected at 900 feet. Both ejections were successful.

The first question to be answered is, why couldn't the landing gear be raised after takeoff? This was the first flight in the aircraft subsequent to the installation of a new left main landing gear strut assembly. A standard nutcracker switch located on the left main strut normally energizes a solenoid that disengages a lock and permits the landing gear handle to be raised when weight is off the landing gear. Examination of the strut revealed the switch had not been making proper contact when the strut was in the extended (weight-off-wheels) position.

Interviews with maintenance personnel involved with changing the strut assembly disclosed that the nutcracker switch was removed from the old strut and installed on the new strut without adjustment.

During the ground functional test after completion of the strut change, the landing gear was cycled 10-15 times. The tests appeared normal and satisfactory in all respects to maintenance personnel stationed outside the aircraft. *However, unknown to them, the individual assigned to the cockpit to raise and lower the landing gear handle had been unable to raise the landing gear handle normally. On his own initiative, and without informing anyone, he had been actuating the override switch to mechanically release the gear handle lock each time the landing gear was retracted. It was determined that this individual normally performed maintenance on F-4s and was not familiar with the A-6.*

The next question is — why did the engines flame out with over 9000 lbs of fuel onboard? In the normal course of flight, fuel is transferred by air pressure from the wing and droptanks to the fuselage tanks and then to the engine. Fuel from the wing tanks and droptanks is routed through a common manifold which leads to the fuselage tanks. Fuel will transfer from the droptanks first, followed by fuel from the wing tanks. This is due to air pressure being greater in the droptanks than in the wing tanks.

Air pressure to the droptanks and wing tanks is regulated by a tank pressurization switch with three positions: OFF, NORMAL, OVERRIDE. When the switch is OFF, there is no pressurization to the tanks. When the switch is NORMAL, the tanks are pressurized *only* when the landing gear is up. If it is desired to pressurize the tanks with the landing gear down, the switch must be placed to OVERRIDE.

Air pressure is also used to dump fuel from the wing and droptanks. By placing the wing dump switch to DUMP, droptank fuel is forced into the wing tanks and out dump valves located in the wings' trailing edges. If the wing dump switch is activated while the tanks are

unpressurized, the dump valves will open, but only a small amount of fuel will be dumped from the wing tanks, usually 1000 lbs or less.

Fuel in the fuselage tank can be dumped by placing the fuselage fuel dump switch to DUMP. Dumping will take place regardless of the position of the landing gear, as pressurization is not required. However, it should be noted that a standpipe in the aft fuselage tank prevents dumping of fuselage fuel below the level of 3600 lbs.

Post-accident investigation revealed damage to fuel indicating system components which might have caused erroneous indicator readings and could explain why the pilot noted 5000-6000 lbs on the fuselage tank gage at the time the low fuel light came on (designed to come on when fuselage fuel is down to 1900-2200 lbs). On the other hand, it is possible that the pilot confused the fuselage tank indications with the wing tank indications. In any event, it is obvious that the pilot — either through lack of knowledge or due to the stress of the situation — mismanaged the fuel system during the short flight.

First, he placed the wing and fuselage switches to DUMP. However, he left the tank pressurization switch in NORMAL. With the landing gear down, the wing and droptanks remained unpressurized. As a result, only 1000 lbs of fuel or less was dumped from the wing tanks. He should have placed the pressurization switch in OVERRIDE.

Secondly, neither he nor the EMCO kept track of the time he had been dumping fuel. At the time the low fuel light came on, both he and the EMCO thought they had been dumping for only 3 or 4 minutes, when in reality, the dump switches had been on for 14 minutes. Fuselage fuel dump can be completed in 3.5 to 4 minutes, and had the pilot and EMCO kept track of the time they had been dumping, more than likely they would have questioned the fuselage fuel quantity indication of 5000-6000 lbs and placed more credence in the low fuel warning light.

Finally, when the low fuel light came on, they could have provided themselves with a little insurance by securing the dump switches (they did this) and pressurizing the tanks by placing the pressurization switch to OVERRIDE (they didn't do this). This would have transferred wing fuel to the fuselage tank and no doubt would have prevented the flameouts.

This accident involved a specific aircraft and crew, but it provides a universal lesson: naval aviation is a demanding profession. Its success depends upon the sharp, *knowledgeable* performance of its members both on the ground and in the air.

(The tired, trite phrase, "Know your aircraft," is more valid today than ever before. — Ed.) ◀



Helo Ditching

A HELICOPTER ditching after a "hot seat turnaround" on an unscheduled ASW mission was due primarily to engine failure. No human factors of significance were involved, the investigating flight surgeon reported.

The escape and survival phase was brief and uncomplicated, and in general, the crew handled the situation well. But, here comes the "however." In three separate instances, the crew failed to follow accepted procedures. With a little less luck, the flight surgeon said, injury or death could have resulted.

- None of the crewmembers were strapped in before a water takeoff attempt. If stronger impact forces had resulted, somebody would have been hurt.

- The pilot did not disconnect his earphone cord before he left the aircraft. If the aircraft had sunk or

inverted rapidly, his situation would have been critical.

- The crew did not take the PK-2 liferaft with them when they left the aircraft, and nobody was wearing an antiexposure suit. If a helo at the scene had not been able to pick them up right away, they would have suffered significant exposure.

The flight surgeon recommended continued emphasis on following *all* standard survival procedures even under *ideal* search and recovery conditions.

The squadron CO agreed.

"Although rescue vehicles were immediately available in this instance," he wrote, "all survival equipment should be taken from the aircraft as it is abandoned. Rescue units are not always available."

After the accident, squadron

training included extra emphasis on realistic ditching drills and abandon-aircraft procedures.

Two in One

TWO cases of dysbarism occurred in a single flight in an EKA-3B although statistically, the odds are against it.

"The occurrence of dysbarism at FL 325, even without preoxygenation," the investigating flight surgeon states, "should be less than 5 percent per person. To have two cases on a single flight is proportionately less likely, but even in the absence of any predisposing factors or previous history, I must conclude that in this case it did happen. The accuracy of the EKA-3B's altimeter was confirmed by the two F-4Js involved in the tanking operation."

The EKA-3B was launched from the carrier without incident on a full-cycle tanker mission. Immediately, the aircraft climbed to 15,000 feet, checked out its tanking package with the A-6 on station, and received 4000 pounds of JP-5. The A-3 then relieved the A-6 on station overhead the ship.

notes from your flight surgeon

At the conclusion of the recovery, the A-3 was vectored north to tank the BARCAP and was instructed to climb to FL300. The *Skywarrior's* air-conditioning system was inoperative. This made it impossible to activate cabin pressurization due to excessive heat. The climb was made with all crewmembers using 100 percent oxygen by mask at ambient pressure.

On station, the weather was solid to FL320. Minimum acceptable VFR tanking altitude was established at FL325.

During the tanking operations, all crewmembers noted that the masks were rather "hard-breathing." After a few minutes on station, the aircraft commander became lightheaded. Activating his pressure-breathing system relieved his symptoms.

The navigator's upper arm began to itch. He became lightheaded, and pain in his left elbow became progressively worse. However, he did not go on pressure-breathing until the pain became severe. (Later, back at sea level, the pain soon stopped.)

The ECM operator also became lightheaded and felt mild pain in his right shoulder. All of his symptoms cleared on use of pressure-breathing.

At the conclusion of tanking, a gradual descent was made. The crew's symptoms disappeared on return to lower altitude. The flight concluded without further incident. Both the navigator and ECM operator were grounded 4 days for observation.

The crew's lightheadedness, which they experienced in addition to dysbarism, may well have been

due to hyperventilation induced by the "hard-breathing" masks, the flight surgeon stated. The pilot, however, made an effort to control his breathing without result, but his symptoms cleared promptly with grunt breathing and the use of pressure-breathing equipment.

"While this incident is primarily aeromedical in nature," the flight surgeon writes, "the questions it raises exceed by a considerable margin the physiological explanations available.

"It would be expected that flights could be made to FL325 in unpressurized aircraft with small, although measurable, risk of hypoxia, hyperventilation, or dysbarism," he continues. "However, in this case, we have such a flight in which all aircrew members reported symptoms suggestive of either hypoxia or hyperventilation, and two of them had definite dysbarism.

"Examination of the life support system after the flight showed that one of the LOX converters was inoperative because of water frozen in its valves. The appropriate amount of oxygen had been used from the second converter, however, and an adequate reserve remained. All masks and regulators were in good condition."

The flight surgeon considered possible reasons for the crew's breathing difficulties.

"I feel that the most likely explanation is that reduced oxygen from single converter operations resulted in hard breathing and subsequent reactive hyperventilation which was relieved by use of the pressure-breathing mode of the diluter-demand regulator. Use of this mode resulted

in much more comfortable breathing, and there was none of the forced sensation familiar to the crew when using the same mode at lower altitudes."

Two Saves

TWO different pieces of personal protective gear saved two different men from serious injury aboard ship recently when an A-7 bolted. The tailhook ripped a 6 to 8-inch piece of metal from a deck edge cover plate and turned it into a lethal projectile.

The flying metal ricocheted off the impact helmet of a man nearby, then struck the right lens of another man's protective goggles. The lens shattered, but remained in the frame.

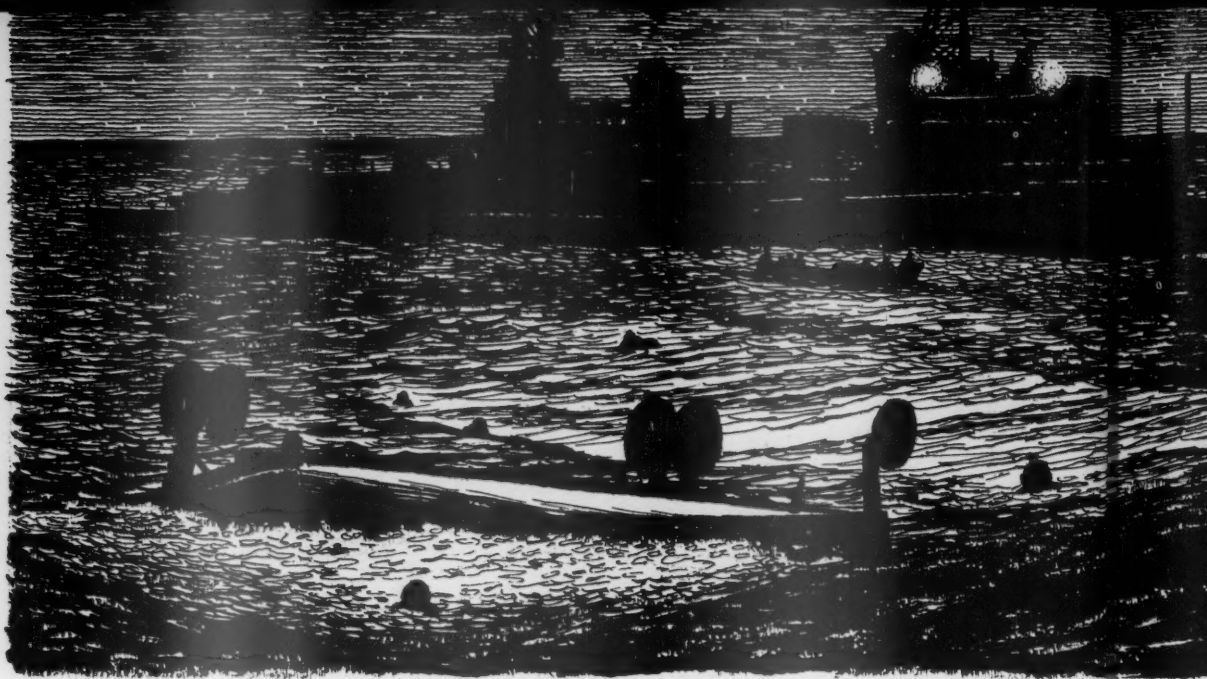
Neither man was injured.

Good show!

Wrong Velcro

IN a water survival situation at night, a survivor tried to attach his velcro-fitted strobe light to the velcro patch on his helmet. The light subsequently fell off and was lost. It was discovered later that both the helmet and the strobe light had hook velcro installed.

NAVAIR 13-1-6.7, Aviation Crew Systems Manual, provides for addition of pile velcro to the helmet for attachment of the SDU-5/E or 761A distress signal light. NAVAIR 13-1-6.3, Survival Kits and Items, stipulates hook velcro on the light. (Remember — *pile* for the helmet and *hook* for the light.) The same publication directs that the strobe light be secured to your survival vest by a nylon cord with a bowline knot. ◀



The Dilbert Dunker:

A Decisive Factor

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I AM a naval aviator with over 4000 hours flight time — approximately 3500 prop and 500 jet — and am presently in a staff billet. On the night of the accident, I was embarked as one of four helo passengers for the return flight to our ship after a conference onboard a carrier. This was my fourth helo transfer of the day and my sixth in the last 2 days.

Takeoff and transit to the ship were normal and uneventful. As we started the approach, the crewman at the aft station opened the cargo door and checked the gear down. The door was left open.

Shortly after the crewman checked the gear, I sensed or noticed the rather flat approach attitude and the lower-than-normal power condition for a landing approach.

During the last seconds of the approach, I also heard what I thought was the starboard engine unwinding. At this time I noticed the crewmen, both of whom had been standing, trying to get strapped into seats. The aft station crewman sat down in the seat next to me.

At this moment, I felt sure the helo was going to crash. This probably better prepared me for what was to follow.

This sequence of events occurred just seconds prior to impact. As the helo continued to descend, it hit what I thought was the water but, in reality, was the lifenets of the ship. The aircraft commenced a very slow roll to starboard, ending up inverted in the water.

There was no noticeable violence associated with water impact. After all motion stopped and the helo came to rest, I unbuckled my seatbelt and dropped to the overhead. I was swept aft by water as the passenger compartment flooded.

As I was swept aft, I tried to find the open cargo hatch, but due to disorientation as a result of the helo being inverted, I was feeling for the open hatch along the port side of the aircraft rather than the starboard side. When the aircraft became completely filled with water, I found myself in an air pocket in the small compartment aft of the passenger/cargo area. I knew this to be aft of the cargo hatch, so I took a breath and went forward again to look for the hatch.

Again I turned in the wrong direction and couldn't find the hatch. I returned to the air pocket and took off my flight deck-type cranial helmet — I don't know why, but at the time I felt it was in the way.

I went over my situation and said to myself, "Turn left rather than right as you go forward." However, as I started forward, I felt the curtain normally sealing off this compartment. I kicked both ways and found the open hatch. I dove down and swam out, coming up beside the fuel cap and its attaching chain, which I grabbed.

Throughout my efforts to escape from the aircraft, I never felt or saw any of the other passengers.

As I held on to the aircraft, I inflated my LPP-1

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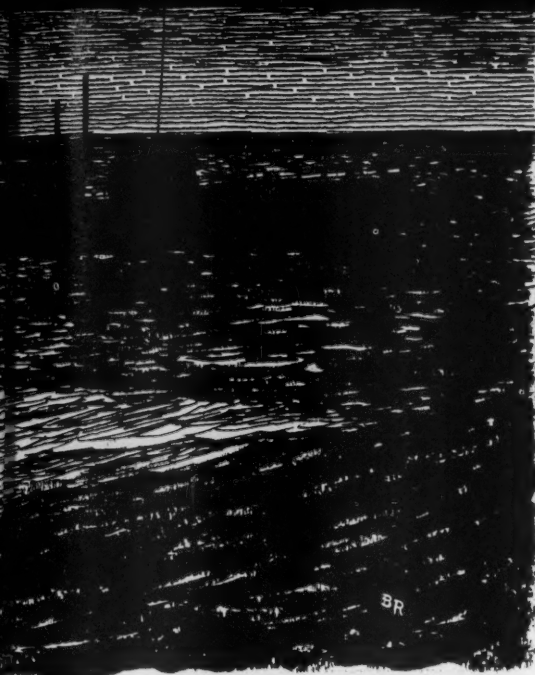
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lifevest. I considered climbing onto the bottom of the helo, which was still afloat, but was afraid it would sink. The temptation, however, was very great. I felt completely exhausted, and the idea of floating in the water was not appealing.

At this time, I saw a multiplace liferaft with one person in it floating toward a ship. The ship looked like a carrier, but was really our ship.

When I attempted to swim from the helo, a wave washed me over the tail pylon. The pylon had a large hole with jagged edges which caused several cuts on my arms.

As I floated in the water, I thought about making water wings out of my trousers, but the effort required to take off my shoes and trousers would be, I felt, too much. I lay back in the water, checked the light on my lifevest, and just floated.

While floating on my back surrounded by debris from the aircraft, a one-man flat pack liferaft — the kind carried in helos — bumped into me. I recognized it as such and felt all the way around it, trying to break the code on how to open it. Finally, I found the pocket flap, opened it, and took the raft out very easily. I quickly found the CO₂ bottle and inflated my new home.

After climbing aboard with a great sense of relief, I looked around and saw that the helo was still floating and that many lights from the ship were sweeping the water. None of these were on me, which I felt was unfair! I searched my lifevest, found my whistle, and blew until somebody shined a light on my raft.

What seemed like 5 minutes later, the ship's motor

This story, a helo passenger's survival narrative, is printed for its value to all potential survivors. Although the investigation of this mishap has not been closed out, the message presented here is felt to be of a timely and urgent nature.

whaleboat came by. I sent it on to the other side of the helicopter where I had seen some flares, since I was quite safe and content in my little raft. The ship had a light on me, and the boat returned in about 5 or 10 minutes and picked me up. After searching some more throughout the area, the boat, which had recovered the two pilots, one crewman, and myself, returned to the ship. (The ship picked up the other helo crewman from the large liferaft.)

Following are some additional observations:

- In my highly excited state, I was not able to hold my breath for any length of time.
- The exhaustion and fatigue I felt after exiting the aircraft were complete and total. I can only compare it to the complete exhaustion I would feel at the end of a 1 3/4-mile crew race knowing I still had to row into the boathouse. While this observation may be wasted on most, knowing that I had been that tired before but having had to continue on, I knew I could again.

I have reached a number of conclusions — lessons learned, you might call them:

- Survival is a very personal thing and requires remaining calm (which I didn't do on my first attempts to get out of the aircraft).
- Knowing or sensing that the aircraft was going to crash better prepared me, I believe, to handle the disorientation and sudden in-rush of water.
- When riding as a passenger in helicopters, where I don't listen to the ICS and where communications due to the noise level are difficult, I always notice whether the hatches/cargo doors are open or closed. In this case, this was very important, as I knew the aft hatch was already open.

- Last, but not least, I made practical use of all the excellent survival training I have received — training which on reflection, I must admit having procrastinated in completing and thought time-consuming and, in some cases, even foolish. After escaping from the aircraft, the one thing clearest to me was that my three Dilbert Dunker rides were most certainly invaluable training.

The survivor's comments on training were reinforced by several endorser.

"This passenger's escape," the squadron commanding officer wrote, "was due only to his many years of training in the aviation community, coupled with a strong determination to survive."

"Training of the type referred to by the surviving passenger, i.e., Dilbert Dunker underwater training," the carrier CO noted, "is the real decisive factor of survival when (you are) placed in this extreme situation." ◀



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A DC-8 pilot from one nation, a 727 pilot from another, and a host-nation tower controller recently used shortcut phraseology; and then each assumed things they shouldn't have. The result — a collision on the runway.

Mishap with a Moral or

A Dangerous Bit of Confusion

The Accident

About 2130 local time, the crew of a 727 held short of the runway as they waited for a DC-8 to land. Though it was after dark, with intermittent rain showers, the visibility between showers was good. When the DC-8 crossed the runway threshold, the tower controller instructed the 727 pilot to taxi into position and hold.

As the DC-8 rolled out, the tower operator instructed the crew to "take taxiway right — call on 121.7." The DC-8 pilot acknowledged, and the tower operator observed the well-lit transport turning towards the taxiway. Assuming that the DC-8 was clear of the active, he read the 727 crew their departure clearance and cleared them for an immediate takeoff.

However, the crew of the DC-8 understood the instructions as "back track if you like, change to 121.7," instead of "take taxiway right — call on 121.7." The DC-8 did turn toward the taxiway, but only to make a 180-degree turn to taxi back up the runway — directly toward the departing 727. The DC-8 crew then changed to ground control, so they didn't hear the takeoff clearance issued to the 727.

Soon after the DC-8 started back up the runway, its pilot noticed landing lights coming toward him. He

On the duty runway, 'a little bit confused,' is like, 'a little bit pregnant.'

increased power and headed the airplane toward the side of the runway. Before he could get the DC-8 clear of the runway, the 727 rotated and lifted off over him. The DC-8 captain felt a jolt, but he believed it to be the nosewheel leaving the runway or contacting a runway light. The danger past, he maneuvered his airplane back to the centerline of the runway and continued taxiing.

The 727 captain saw the other aircraft at about the time his aircraft reached 100 knots; but he felt it was too late to reject the takeoff, so he concentrated on

using normal takeoff procedures, avoiding overrotation.

The tower operator saw the DC-8's landing lights turn and, assuming the DC-8 to be turning onto another taxiway, instructed the crew to continue taxiing straight ahead and cross runway 07. At this time the DC-8 crew saw the landing lights from another plane on final and informed the tower. It was at this time the tower operator questioned the crew about their location. When informed that they were still on the duty runway, the controller sent the second approaching airplane around.

About this time, the 727 pilot reported that he had hit an aircraft during takeoff, had lost all his hydraulics, and was returning to land.

The controller then cleared the DC-8 pilot off the runway and informed him of the incident. The captain acknowledged and said that his aircraft was handling normally and proceeded to taxi to the terminal. There he found that a large portion of the vertical stabilizer was missing.

While ground crews cleared the runway of debris, the 727 crew dumped fuel and landed without incident.

Errors

There were several errors in this accident. First, the DC-8 crew copied the taxi clearance wrong, and the tower controller did not detect the error. Second, the controller cleared the 727 for takeoff, but the crew did not clear themselves before releasing their brakes. And finally, the 727 captain did not abort the takeoff or use a steeper climb angle once he detected the DC-8 on the runway. Both of these actions were determined to be within the 727's capabilities.

A conversation recorded on the 727's cockpit voice recorder was very interesting. Approximately 18 seconds before the collision, the captain said, "How far ahead is he?" At this time he was traveling at 100 knots and had traversed about one-third of the distance from start-of-roll point to the other aircraft. Post-accident arithmetic showed that if the captain had elected to reject at that time, he could have stopped his aircraft short of the DC-8.

Lessons

Luckily no one was injured in this mishap, but there are several lessons to be learned.

First, to prevent a misunderstanding between you and



a controller, always use standard phraseology and do not hesitate to ask the controller to "say again," if there is any doubt about what was said.

Second, be suspicious of what seems to be an unusual clearance. For example, wrong direction flight levels or, in this particular case, permission to taxi back on the active runway at a busy airport, especially when there are equally acceptable alternate routes.

Third, when you are instructed to change frequencies, you should also receive instructions when or where to change; for example, "change to 121.7 after clearing runway." *Anytime you receive a clearance to use ground control while operating on the active runway - question it.*

Fourth, a tower controller should never assume an aircraft is clear of the runway unless he positively knows this by visual observation, ground radar, or a pilot report. Perspective between runways and taxiways over long distances can be (and usually is) very deceptive, as was the case in this accident.

And finally, it's your responsibility to double-check the runway and approach before taking the active or crossing a runway.

Several years ago we proved this last point when we had a similar accident in MAC. A *Starlifter* pilot made a smooth touchdown on the left of two parallel runways. At the end of his landing roll, he turned right, onto a taxiway, and proceeded towards the ramp. The aircraft was just beginning to cross the right runway when it was struck by a jet fighter on takeoff roll. Five MAC crewmembers died and one was injured. Both aircraft

were destroyed.

The investigation showed that both aircraft were poorly lighted. The '141 was using only position lights, and the fighter wasn't using landing lights for takeoff. To make matters worse, communications between the tower and the aircraft were poor. The tower operators said they had not cleared the '141 across the runway, but it was obvious that the crew felt that they had.

The investigation board charged the cause to pilot error because, cleared or not, the C-141 aircraft commander should have cleared himself visually before proceeding across the runway.

Even though English is the international language of aviation, it is sometimes difficult for one man to understand his native tongue when someone else applies the accents and brogues of another nation. When we compound the problems with bits of slang or verbal shortcuts, we can pretty well prevent communication. We don't even need to add assumptions, radio static, an unfamiliar environment, crew fatigue, limited visibility, a mechanical emergency, or any of a host of other factors, before the end is likely to be smoking wreckage. Just one or two of these can trigger a breakdown in communication, and that's all it takes to produce a dangerous bit of confusion.

Courtesy The MAC Flyer

(Although we don't operate DC-8s, 727s, or Starlifters, the circumstances leading up to these mishaps are universal and applicable to any aircraft - any airfield - anytime. - Ed.)

"Tow Woe, or how we dinged another MAD boom head"

MOST ground accidents are due to carelessness, and most S-2 MAD boom head dings during towing are inexcusable. Hear now a story which explains why COs sometime get gray hair prematurely.

A well-cared for *Stoof* was parked in a hangar when the powers-that-be said to roll her out. The line crew attached an NT-4 towbar to the tail section, but the spring clip on the towbar didn't close around the port attaching point. This went unnoticed, and the crew began to move the aircraft - port arm of the towbar unlocked.

All might have gone well if contractors who build hangars and pour concrete had done the job on the level. However, 'twas not the case. The crew had to negotiate a 2-inch lip along the hangar door track. As the port gear hit this lip, stress was placed on the towbar, and the port

arm disconnected. The aircraft swerved to the left, and the horizontal stabilizer hit the hangar door.

To prevent the towbar from striking the MAD boom head, a jury-rig (a piece of 2 x 4) had been placed under the tailhook and across the arms of the towbar.

After the tail of the *Stoof* had zapped the door, the crew reconnected the towbar properly and began towing again. As the aircraft moved down the incline outside the hangar, the S-2 pivoted. The 2 x 4 slid out of position and was forced up into the MAD boom head. *The jury-rig damaged the very part it was supposed to protect.*

Owners and operators of S-2 aircraft are referred to the July '72 issue of *APPROACH* to see, again, how the Canadians protect the MAD boom head during towing.



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SMACK INTO THE MOUNTAINSIDE

or a Lack of Depth Perception

AN A-7E pilot took off from a coastal NAS, filed VFR for an inland NAAS. When he failed to arrive at destination, an intensive SAR effort was mounted and continued for 22 days with negative results. Approximately 6 months later, the wreckage of the missing aircraft was located at the 8000-foot level on the slope of a mountain 60 miles off the planned route of flight. The pilot perished in the crash. There was no evidence of any ejection attempt.

It was determined that the aircraft had crashed in a wings-level attitude while climbing up the side of the mountain. There was no evidence of any material failure, either in the airframe or engine.

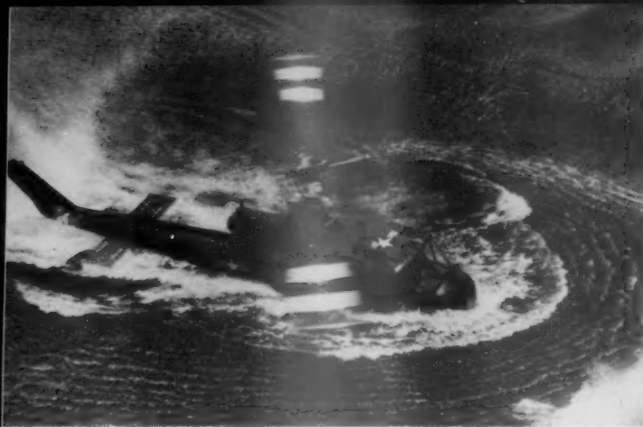
The reason for the pilot's deviation from the filed route could not be determined. However, it is known that the pilot had great enthusiasm for snow skiing. Whatever the reason, investigators considered it intentional. The weather was clear, the aircraft nav aids functioning at the time of departure, and the pilot was a capable navigator. All these facts tend to rule out the

possibility of his being lost.

Weather at the scene on the day of the accident was reported as clear with 30 inches of snow at the 6500-foot level. It was estimated that the snow at point of impact was at least 30 inches deep.

Investigators noted that while flying over snow-covered terrain at low altitude, the surface lacks contrast, which contributes to a lack of depth perception. In mountainous terrain, depth perception is generally facilitated by shadow patterns cast by vertical development as well as color contrast offered by trees, outcroppings of rock, etc. The heavy snow cover in the area, lack of trees, and unfavorable sun angle at the time all combined to reduce shadow patterns and color contrast which could have drastically reduced the pilot's depth perception.

Investigators concluded that the most probable cause of the accident was the pilot's inability to properly judge his elevation above the terrain while attempting to clear a ridge. ◀



Helo in the Water

42

THE PILOTS and crewmen were assigned their first combat mission. A briefing was conducted the night before, but certain information, such as landing areas for refueling, was not confirmed until the following morning.

The plan initially called for each aircraft to refuel from the deck it had departed. In the event of a delay, an open deck would be provided on another ship. When all the details were worked out, a flight schedule was published — about 2 hours before the first launch.

The pilot of the ill-fated UH-1E was a gunship section leader. The gunships were to provide cover for crew extractions if any aircraft was forced down. As things turned out, no emergency extractions were required. Upon completion of the mission, the pilot returned to his designated ship to refuel. However, due to a fouled deck, he was not able to land and was diverted to another ship. He landed there with about 5 minutes of fuel remaining.

Deck space was at a premium, so the gunship pilot was advised to refuel, launch, and proceed to another ship — like quickly. Other aircraft were waiting to refuel. When ready to launch, the pilot was given winds 15 degrees port, 3 knots. (It registered in his mind as 13 knots.) He lifted, slid sideward off the deck, but was unable to stay airborne. (The photographs show the next



sequence of events.)

It was later determined that the helicopter was about 500 pounds over HOGE (hover out of ground effect) weight, and once the pilot left ground effect aboard ship, the result was inevitable.

The conditions which prevailed, weather, tempo of operations, high gross weights, etc., were not unusual, and these same conditions will continue to occur time and again. So what can helicopter pilots learn from this accident to prevent future mishaps of this type?

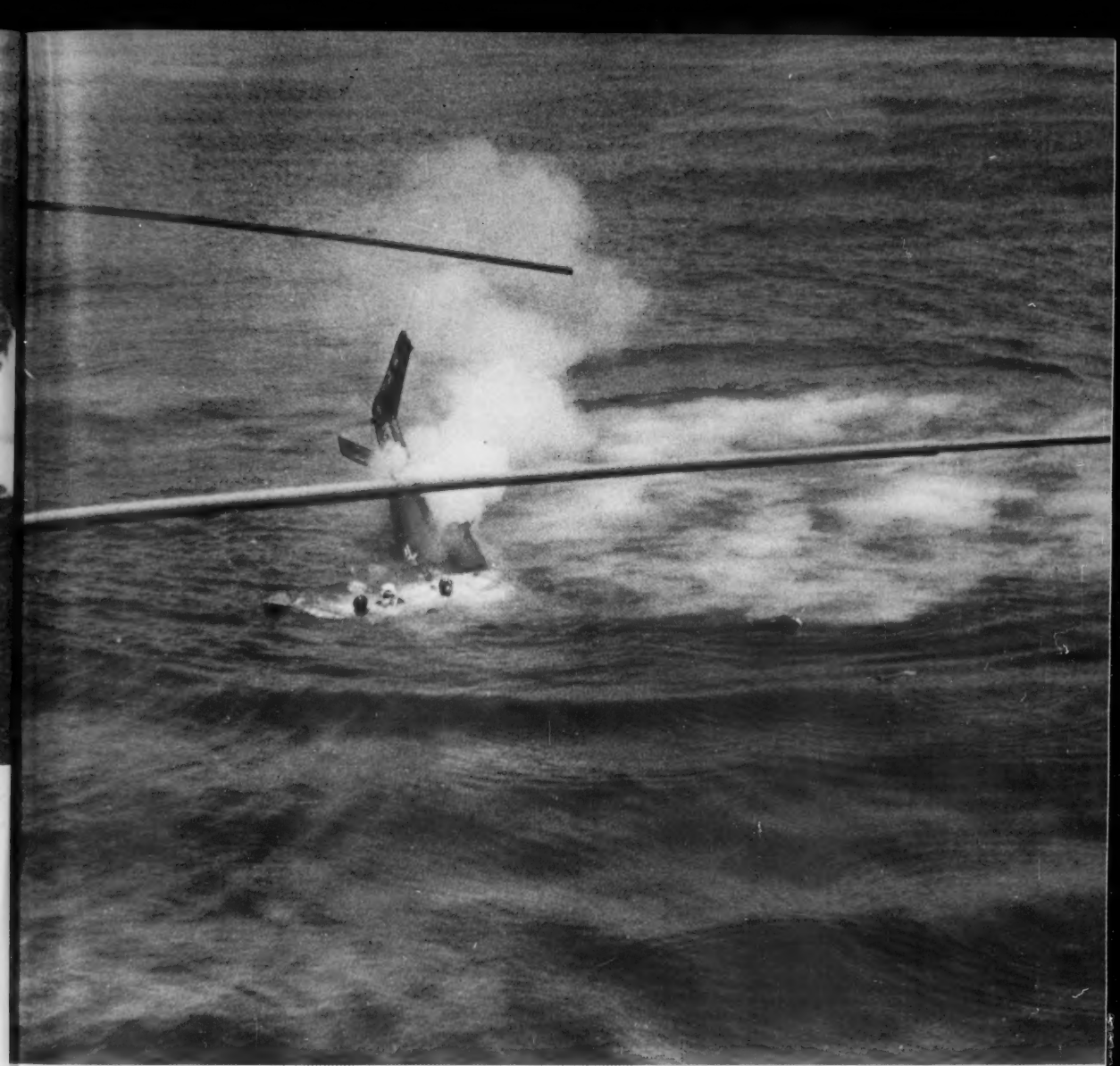
- The faster the tempo the more careful and thorough a pilot must be. If pilots are hurried, each action and reaction must be done with measured deliberation. Ensure that checklists, briefings, and area clearances are completed — that everything is, in fact, ready for launch.

- When other aircraft, superfluous personnel, or stacked decks leave little or no room for a good hover check, a pilot must know whether or not ambient conditions will permit safe flight. It's one thing to be able to hover in ground effect, but it's quite another thing to be able to fly.

- Uppermost in the mind of every helo pilot (operating from tight deck areas) must be the actions he

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will take to lighten the helicopter if an emergency arises. Know what gear you can get rid of quickly, and have it ready to dump. Several helicopters have been saved, even after they were in the water, because the crew promptly unloaded fuel, cargo, ammo boxes, or ordnance. After getting rid of some weight and regaining RPM, they were able to take off.

- Helicopter pilots are often requested to approach, hover, land, or take off under conditions that most fixed-wing pilots would never have to consider. Know what you and your machine can do comfortably, and if these conditions are not met, you're a no-go. *Period.*

The chronology was:

1229 — Landed for "short drink."

1241 — Lifted to continue mission.

1242 — Crashed off portside. Launched rescue boat.

1244 — Rescue boat in the water.

1304 — Boat back at the rail, all survivors aboard.

(WELL DONE to the motor whaleboat rescue crew of OKINAWA:

WO C. J. WISE, boat officer

BM3 R. B. MCCURDY, coxswain

EN3 K. D. WORM, boat engineer

SN W. M. NEVULIS, bowhook)



Happy Incident

On location: South China Sea

Time: Summer afternoon

Aircraft: SH-3G

Owner: HC-1 Det 1

Scene: Airborne, 250 feet, climbing

THE PILOT of the *Sea King* was whirling away on a routine mission. His first crewman noticed that the lower half of the personnel door was not properly secured. When the crewman attempted to secure it, the door flew open, snapping the cables, and the wind flattened the door against the fuselage.

The crewman, holding on to the door to prevent it from flying through the main rotor blades or tail rotor, was prevented from falling out of the helicopter by *HIS GUNNER'S BELT!*

The pilot came to a hover, and the door was closed and secured.

At least one life was saved, and possibly the helo, because the crewman was wearing his gunner's belt and had it properly secured. ▶

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The Constellation Orion.

Letters

A good supervisor is a man who can step on your toes without mussing up the shine.

Ace L.

Confined Area Landing

FPO, San Francisco — We've all seen and laughed at the joke showing a Boeing 707 parked on top of a mountain and one of the passengers saying, "I believe this is a good time to congratulate Captain Jones on his landing." Well, did you ever wonder who flattened the top of that mountain?

Everyone has a story they call their closest scrape with death. Mine occurred in the Spring of 1970 during a 2-week, active-duty period at Naval Air Station Los Alamitos. We departed Los Al in our SH-3A at 0900 on a routine training hop and decided to take a run out to the desert where the Palmdale Super-Airport was soon to be built. The safest route was straight across downtown Los Angeles and through the San Fernando Valley. We stuck close to the freeways because these sometimes offer the only emergency landing sites in a metropolitan area. By the time we reached Palmdale, we were falling behind schedule; and since another crew needed the bird at 1300, our return track took us directly across the Angeles National Forest.

During this period with the Reserves, I was flying a traffic patrol helicopter for KABC Radio in Los Angeles. After several forced landings, I had developed a keen eye for emergency landing areas. For that reason, I asked the HAC (Aircraft Commander) if we couldn't follow the freeways back to Los Al — just as we had on the first leg of our flight. The HAC felt it was more important to get back at our planned recovery time, so we ended up at 7000 feet over a 6500 foot peak.

Our first indication that something was wrong was when I smelled hot oil,

and our crewmen started yelling that they were being bathed in the stuff. The No. 2 transmission oil filter cover had come off. In a matter of seconds, we had pumped all of our oil over the side and down into the cabin. The HAC entered an immediate autorotation. I lowered the gear, put the IFF to emergency, and got out a MAYDAY. (I received at least two answers — one from L.A. International and the other from MCAS El Toro in Santa Ana.)

Meanwhile, we were both looking for a suitable landing area, but the terrain was nothing but 45-degree slopes with no flat spots except some irregular fire breaks that were much too small for a helicopter. We had all but given up hope when we spotted a small mountain (later identified as Mt. Disappointment) directly ahead of us with its top flattened off, just like in the joke. There seemed no reason for it, but some guy had stopped while cutting fire breaks and took off the top of this hill. It gave us a perfect landing spot about half the size of a football field.

What's even more amazing, we didn't have to adjust either our heading or airspeed to reach it.

Since the engines were still operating, we used power on touchdown; and upon securing them, the transmission started to seize. The rotor brake was not necessary. A couple days later when the mechanics finally got a chance to inspect the transmission, they told us that the transmission and rotors would have seized in the air in another 10 seconds.

If I could find the guy with the bulldozer, I'd buy him a case of the finest.

LT R. L. Johnson, USN
HC-1

● You did luck out, but you played down two very important aspects of your emergency which all pilots must think about.

First, by virtue of your experience in

civilian helicopter flying, you made it a habit to look for suitable landing sites — just in case. When the flattened hilltop came into view, both of you were all set to take advantage of the small area on which to make a routine landing. You might not think this was a big deal, but naval aviation history is full of accidents where a pilot was so engrossed in an emergency approach that he landed in an unsuitable area — when a flat field without obstructions was also available.

Second, you and the HAC displayed perfect cockpit coordination. While he flew the bird, you broadcast your plight, covered the checklist, and prepared the aircraft for landing. It's one thing to know your emergency procedures, but quite another thing to execute them correctly under stress.

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Fire in Flight

FPO, New York — Your July "Fire in Flight" reminded me of an APPROACH article printed "eight or fourteen" years ago. It was taken from "TWA Tips," and concerned a shorted submerged fuel pump which caused a tank explosion in a *Super Connie*, blowing the top of the wing over the tank completely off. TWA determined by tests that if 10 percent tank capacity of fuel were left, the resulting "air-fuel fumes" mixture would be too dense to support combustion. So far as I know, this policy was never officially adopted by the Navy; however, in our aircraft we routinely leave that amount for that reason. Sorry I didn't mention this sooner.

R. K. Jones

● Assuming that the author is writing about C-121 type aircraft, the Navy did not adopt TWA's suggestion to keep the last 10 percent of a fuel tank's capacity from not being consumed due to weight considerations.

The design zero fuel weight (total

aircraft weight with no usable fuel on board) is 100,000 pounds. Normally on landing, tanks 2 and 3 (inboard wing) and tanks 5 and 6 (fuselage) are empty. If these tanks have fuel in them, the weight must be computed in the zero fuel weight. Since many of our EC-121 aircraft with a full crew aboard are operating at close to design zero fuel weight limit, it would cause the limit to be exceeded by 1919 pounds. This could cause overstress of the wing with resulting main wing spar cracks. (Re: NATOPS manual.)

SOP??

FPO, San Francisco - It is my considered opinion that SOP is adhered to aboard little bird farms (CVS) and big bird farms (CVA) - only when convenient. Expediency and full-blown ops call for something else. For example, aboard one fine USS it is common practice to remove tiedowns and chocks as soon as the rotor blades are turning. SOP requires a helicopter to remain tied down and chocked when the ship is turning. The other day while preparing to launch, the ship was turning enough to register 10 degrees angle-of-bank on the helo's gyro. The deck was wet and slippery and, combined with the turn, was enough for the helicopter to slide downhill.

Any mouse

● Until the pilot gives the signal that he is ready to launch, those tiedowns are not to be removed. And, since no helo driver in his right mind would signal that he's "ready" during a heel to port (or starboard), what's this "breaking the chains" in a turn bit?

Not having much more to go on, it looks like you've one of two problems aboard your ship. Either 1) there are no CVA/CVS NATOPS manuals available, or 2) those setting flight ops policy don't put much faith in NATOPS.

Hopefully, this is an isolated case. The potential for disaster with a helo turning loose on deck runs the gamut from a pucker incident to a multiple-fatality accident. A sudden "man overboard" and subsequent, possibly unannounced, hard turn could set the stage for a full blown catastrophe.

I'll bet the ship's CO is neither aware of the conflict (with NATOPS) nor of the hazards involved. The helo det's O-in-C should invite attention to both.



Casual

FPO, New York - Periodically, we've seen requests in APPROACH for action photographs from Fleet squadrons. So we thought we'd take advantage of the scheduled inflight refueling and put a photographer aboard ship to take some pictures. The photographer not only caught the helicopter and refueling crew in action, but also provided us with a look at the casual sailor. His uniform may be all right for some kind of below-deck activity, but common sense dictates otherwise for topside activity. The operation was completed safely, but what if . . . ?

LT Charles DelCampo
HC-2

● Wonder how many pairs of eyes actually saw the soft-shoe act without it registering on the mind? The eye picked up the uniform violation quickly in the photograph, but could have easily missed it on deck where the action was. The supervisor should have run him out of there. It's another case where the "can do" attitude "can do you in."

Passenger sans Seats

FPO, Coastville - Recently, I was scheduled for a cross-country flight to a distant NAS. We had room for two pilots and three aircrewmembers (all

seats were filled). I overheard a conversation before departure that we were to pick up an extra passenger on return.

After several inquiries, I found the "rumor" to be official, whereupon, I stated my objections through the squadron chain of command to the CO. I felt this proposed situation was unsat and should not occur. It didn't take long for a feedback, and I was told to bring back the extra passenger as directed.

We launched without further ado, and met our passenger at destination.

The return trip was made without difficulty, except I became concerned when we encountered light turbulence. I knew that all the extra soul could do was hang on.

I know now as I knew then that the action was unsat, and even though I'm not the oldest nor the boldest pilot in the squadron, I know what NATOPS says.

Any mouse

● Well, my friend, here's how it looks to us. You weren't the first pilot, nor will you be the last (see the following letter), to carry excess passengers in an aircraft. However, there is a far more serious problem involved here than the act itself.

The problem is why "competent" authority directed you, or anyone, to intentionally and willfully violate a directive. When anyone risks human life

needlessly, that person is in dire need of counseling.

Your position was between a rock and a hard place. You were directed to make the flight in spite of your objections. Fortunately, all went well; but make no mistake, if there had been a mishap, you'd have been hung so high the buzzards couldn't reach you. Others might have swung too, but you wouldn't have received any satisfaction from their plight.

It is very difficult for us, who review accident reports (by the hundreds) and incident reports (by the thousands), to remain objective. Let it suffice to say there is NO place in naval aviation for premeditated stupidity, and carrying more passengers than there are seats certainly falls under that category.

(See next Letter)



Complacency and a desire to RTB rapidly on the part of the ship and helo crew seem to be the major culprits in this incident. Fortunately, nothing out of the ordinary happened, and all hands arrived at Homebase safe and sound. In the conduct of military flight ops, each crew, both ship and air, must be disciplined enough to follow standardized procedures that afford the greatest amount of safety for all concerned. In this instance, had existing procedures and regulations been properly adhered to, this would never have occurred. It's simply a matter of discipline and professionalism, Gents.

Luckymouse

- Another real classic!
Course, it happens quite often (twice

on this page) – same plot, same lyrics. The endings, however, are not always happy.

Stunts like this make a fellow kinda wonder why we're paying safety and NATOPS officers. Can anyone think of a reason, short of the ship sinking or a national emergency, to crowd more people than there are seats into any aircraft? (The passengers sans seats should have displayed more smarts than to accept such a situation.) Is getting home to mom that urgent?

Although the H-46 NATOPS does not offer details on passenger seat requirements, General NATOPS does. Paragraph 611 simply states that the number of persons over 2 years of age embarked in a naval aircraft for flight shall be restricted to the number for which there are adequate seats and safety belts.

That same chapter of General NATOPS, *Safety*, has a few words on passenger briefings relative to personal safety and survival equipment (para. 603). Briefings are mandatory!

As far as manifesting passengers, Chapter 3, *Flight Authorization* . . . assigns the responsibility to the pilot. In this case, however, where the aircraft is ferrying without physically filing a DD-175, then the passenger listing comes under the ATO's, or the ship's, responsibility.

Relative to internal cargo not being secured, go back to Chapter 6, para. 603b.

Apparently, those blue NATOPS covers are real delicacies – leastwise for some units. They're apparently the only items consumed from NATOPS. ◀

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approach/november 1972



Midair Collision Avoidance

A MIDAIR collision occurred recently between two light jets resulting in one fatality and the loss of both planes. The aircraft, on separate missions, collided in the transition zone between the positive control area and the offshore operating area. Weather in the vicinity was clear.

It appears that one pilot was engaged with radio and transponder changes which drew his attention into the cockpit during a critical crossing situation. The other flight simply did not see his aircraft. No warning or traffic information was received from control activities.

Positive control has been extended tremendously in the past several years just to prevent this type of accident. However, positive control in visual flight conditions *does not* relieve the pilot of the requirement for maintaining an alert lookout. It *does* require the pilot to closely follow flight clearances and maneuvering restrictions to ensure adequate aircraft separation. The tendency to relax in adhering to positive control procedures and mandatory flight tracks when operating in a permissive visual flight condition must be avoided. At current closure rates, 5 seconds of inattention brings two aircraft 1 mile closer to catastrophe.

The vulnerability of aircraft transiting control areas has been graphically demonstrated at the cost of one life and 3 million dollars. *Alert visual doctrine should have prevented the collision.* Steps are being taken to further increase positive control effectiveness. However, each pilot must continuously maintain alert visual surveillance, transit flight control areas with caution, and strictly adhere to the flight rules under which he is operating to ensure aircraft separation essential to the elimination of midair collisions.

Adapted from a Type Commander's Msg.





